CLIMAPS

DATA MANAGEMENT SYSTEM

for the

CLiMET CI-8060, CI-6300, CI-6400 and the CI-7000 Series

Airborne Particle Counters and Monitors

Release 2.3

December 9, 1991

January, 1986
February 3, 1987
December, 1987
August, 1988
December, 1991

i

INTRODUCTION

For several years there has been a need for a general purpose microcomputer software system to manage the acquisition and processing of the data stream from electronic particle counters and analyzers. Unfortunately, it seemed that each user had a slightly different problem to solve so a truly general purpose system with a broad scope of application appeared unlikely to be developed.

Climet has now solved the scope problem with the development of the **CLIMAPS** system for use with its CI-8060, CI-6300, CI-6400, and the 7000 series Particle Counters and Monitors. The system can be tailored by the user to suit an endless variety of applications from micro-contamination control in manufacturing clean rooms to environmental monitoring and analysis.

The system is distributed on floppy diskettes, but must be installed on a hard disk system.

The distribution diskettes are not copy-protected in the usual sense. Instead, each copy of the system contains encrypted information to identify it with the registered owner and make it of little use to anyone else. This is the only form of copy protection used. You are encouraged to make backup copies of the software for installation and other purposes. The distribution diskettes should be stored in a safe place.

You should be aware that any attempt to remove or alter the encrypted information will more than likely render the system unsuitable for its intended purpose.

CLIMAPS HISTORY

January, 1986

> Release 1.0   Initial release.   Manage the data stream for two sets of instrumentation with up to 8 data channels each and up to 12 sampling ports.

December, 1986

> Release 1.10   Added rescaling features for Graphs and Plots.

December, 1987

> Release 2.0   Added enhancements for the CI-7000 series particle counters and CI-310 multiport samplers. Increased the number of ports from 12 to 30 and added Air Velocity and Aux. channels.

August, 1988

> Release 2.1 Added enhancements for:
>
> - Federal Standard 209D
> - Generation of Lotus compatible data files
> - EGA Graphics capability
> - Selectable date format
> - Graphs and Plots using multiple data sets
> - Logarithmic Y-axis on Graphs and Plots   —

April, 1991

> Release 2.2 Added enhancements to close the data file while the computer is waiting for data to be sent from the particle counter.

October, 1991

> Release 2.3 Fixed some problems with the monthly log graph of several different data sets.   Changed format of the 209D report in the reports module.

INDEX

HARDWARE REQUIREMENTS

The software is certified for operation on the following
micro-computers: IBM-PC, IBM-XT, IBM PC/AT, IBM PS/2, and
true compatibles such as Compaq Portable and Compaq DeskPro,
running under PC DOS version 3.1 or later, with a minimum of
512K RAM and a hard drive, and a mono, CGA or EGA video card
and monitor. (EGA recommended) Graphs can be displayed on
the monitor with either CGA or EGA video systems.

If you have a COMPAQ computer, you can display graphs on the
MONO monitor. Graphs can be displayed on the Mono monitor of
systems equipped with a Paradise Modular Graphics Card or its
equivalent but not on systems with the Hercules Monochrome
Graphics Card.

Because of the limited distribution potential for the soft-
ware, no hardware components will be supported other than
those listed below:

MINIMUM RECOMMENDED HARDWARE:

    1 - Microcomputer from above list with at least 512K RAM
    1 - Video card, either color or monochrome
    1 - Video monitor to match video card
    1 - 360K floppy drive with controller card
    1 - 20MB or larger hard drive
    1 - Real time Clock/calendar card such as AST 6-Pak
        (Required for PC or PC/XT only)
    1 - Parallel printer port
    1 - Serial port
    1 - EPSON FX-85 Dot matrix printer or equivalent
    1 - Parallel printer cable
    1 - CLIMET CI-8060, CI-6300, CI-6400, or CI-7000 series
        particle counter
    1 - Special Serial connector cable:
            Lines 1,2,3,7 only connected.

    Optional:

    1 - CLIMET CI-298 or CI-310 Multiport Sampler

This configuration will manage the data output from a single
Airborne Particle Counter, with dot-matrix printed reports
and graphs in black and white. The system can be configured
to save data files to a floppy diskette if desired. At a
sample rate of one per minute a single floppy data diskette
will store the data for about 140 hours of operation which
should be satisfactory for infrequent use, but for systems
capturing and processing data on a daily basis a hard disk
should be used.

1-1

MAXIMUM REQUIREMENTS:

1 - Microcomputer from list with at least 512K RAM
1 - Video card, either color or monochrome
1 - Video monitor to match video card
1 - or 2 - 360K floppy drives with controller card
1 - 20MB or larger hard drive with controller card
1 - Real time clock card such as AST "SIXPAK"
    (Required for PC and PC/XT only)
1 - Parallel printer port
1 - Serial port
1 - additional serial port (for a total of 2)
1 - additional parallel printer port (Or an A/B printer
    select switch with cable)
1 - EPSON FX-85 or equivalent dot matrix printer
1 - EPSON HI-80 4-color plotter
2 - Parallel printer cables
2 - CLIMET CI-8060,CI-6300, CI-6400 or CI-7000 particle
    counters
2 - Special Serial connector cables:
        Lines 1,2,3,7 only connected.
2 - CLIMET CI-298 or CI-310 Multiport samplers

This configuration will manage the data output from the two
Airborne Particle Counters, producing reports and graphs as
above plus pen-plotted graphs in four colors.

The data storage area of the 20MB hard drive will store the
data for about 120 days of operation. The CLIMAPS System
creates a new data file for each calendar day of operation.
Thus, 120 days of operation would lead to 120 data files on
the hard drive. This number is about as many as you can
conveniently handle on the screen.

SYMBOLS AND CONVENTIONS

In this manual, a number of special symbols are used as a
form of shorthand:

C: This is used throughout the manual to represent the hard
disk where you have the CLIMAPS software installed. If you
have your system configured so that your hard drive is
designated as D: or E: then you must mentally supply the
correct drive letter each time you see C:.

[] This pair of square brackets is used to represent a single
    character calculated or furnished by the computer.
    Whenever you see this symbol, try to visualize a suitable
    number or letter in its place.

[B] A pair of square brackets with a character or combination
    of characters inside always represents one of the keys on
    the keyboard. This symbol represents the key "B".

[-->|] Represents the "TAB" key to the left of the "Q" key.

[<--'] Represents the "Return" or "Enter" key. It is used to
        "Enter" information into the micro computer after it
        has been typed on the keyboard. Many times you will
        be instructed to PRESS [<--'] to make a certain thing
        happen, such as "Move down to the next line". We have
        tried to keep things as simple as possible, so all
        single-character keyboard entries are automatic in the
        sense that as soon as you press a requested key, the
        program execution takes place without the need to
        press [<--'].

[F4]   There are 10 special keys at the left of the keyboard
        (or along the top on the Enhanced AT keyboard) called
        "Function Keys". This symbol refers the key labeled
        "F4". Each of the 10 keys (there may be more than 10,
        but only 10 are used by CLIMAPS) can be assigned to
        perform a special function. For instance in the
        CLIMAPS system, [F4] is used for the "PRINT SCREEN"
        function. When this function is available, you will
        see a message to that effect on the bottom line of the
        screen. (This line is called the STATUS line. You
        will see this term used often.)

        Other function keys are used for different purposes,
        and the specific use will always be displayed on the
        screen when it is available.

[Esc]   This symbol represents the "Escape" key. Escape sort
        of carries the connotation of getting out or getting
        away, and that is exactly what we use it for. You
        will frequently see messages such as "[Esc]-EXIT",
        which means: "Press [Esc] to EXIT from the thing that
        you are now doing". For example, on the first screen
        of the MAP Module you will see this message at the
        right of the STATUS line. What it means is "To get
        out of the MAP module, press [Esc]". On EXIT from any
        program module, the system always returns to the MAIN
        MENU.

OOPS   This function is intended for use in the situation
        where you want to say "Oops, I didn't really mean to
        do that", and you would like to go back where you
        were. The function is called by pressing [Esc]. For
        instance if you accidentally press a key and get to a
        new part of the program by mistake, try pressing
        [Esc]. If the OOPS function is enabled the system
        will back up to where you were just prior to the
        mistake. The OOPS function is not always enabled
        because there are some situations that you simply
        cannot back out of. But in any case, if you find
        yourself in trouble, try OOPS. It certainly can't do
        any harm, and it just might take care of your problem.

Prompt: **XXXXXXXXXXXXX XXXX XXXXXXX XXXXX**

You will see this notation frequently in the Manual.
The **BOLD** row of "X" characters represents a message or
"Prompt" supplied by the software.   This notation is
meant to indicate that at this point in the program
execution the computer will print the prompt. The next
sentence or paragraph will explain what action you are
expected to take when you see this prompt.

GETTING STARTED

If you have HARDWARE that meets the requirements, you should
first turn on each piece of equipment separately and check
out operation per the instructions that came with that piece
of equipment.

For instance, the simplest way to check out a printer is to
first set it up according to the instructions in the printer
manual. Load some paper and get it feeding properly. Now,
get the computer running with some text on the screen. The
easiest way to this is to enter the command "DIR" from the
DOS prompt. Press and hold down the Shift key and then press
the PrtSc key to dump the screen contents to the printer. If
all connections are properly made you should print an image
of the screen.

After you have determined that all of the equipment is
operating correctly, connect everything together according to
the connection diagrams in Appendix B.

BACKUP DISKETTES

It is extremely advisable to have BACKUP copies of your
program and data files stored at a location away from the
place where you have the computer system. The reason for
this is that in case of an accident such as water damage or
fire, you can always take care of the hardware by repair or
replacement, but the information on your hard disk cannot be
replaced unless a duplicate copy is available.

As you use the software and generate data that is of value,
you should use a backup procedure that is suited to your
needs to backup the data on a periodic basis. The following
will explain exactly how to backup the distribution
diskettes, which only needs to be done once.

1.   Remove diskettes from both floppy disk drives if the
      system has more than one.
2.   Before you do anything else, put a "write protect" tab
      over the square notch on both distribution diskettes.
      This will protect the information on the diskette from
      being erased if you make a mistake.

3.   Press [Ctrl-Alt-Del] to BOOT the system.

4.   When you see the "C:>" prompt, type "diskcopy a: b:" and
      press [<--']. Don't type the " " marks, just the text
      enclosed by them. You can use either lower case or upper
      case letters.

      What you have typed on the screen is a command that
      tells the computer to make an exact copy of the diskette
      that will be in drive "A" onto the one that will be in

drive "B". (If the system only has one floppy disk
drive, you will be asked to insert the SOURCE or TARGET
diskette into drive A: from time to time)

Prompt: Insert source diskette in drive A:

                 Insert target diskette in drive B:

                 Strike any key when ready

5.   Place the distribution INSTALL disk in drive "A".

6.   Place a blank diskette in drive "B". This diskette
     cannot have a write protect tab. (The reason that you
     put the tab on the diskette in drive "A" is that if you
     place that diskette in drive "B" by accident, the system
     will find the tab, stop the copy process, and no harm
     will be done).

7.   Press [Any key]. The system will now copy all of the
     information from the diskette in drive "A" to the one in
     drive "B" to make it an exact duplicate.

Prompt: Copy another (Y/N)?

8.   Remove the diskette from drive "B" and label it:

                 CLIMAPS I - INSTALL DISK

9.   Place the distribution CLIMAPS PROGRAM diskette in drive
     A: and a blank diskette in drive B:. Then enter "Y" to
     repeat the process. When finished, remove the diskette
     from drive B: and label it:

                 CLIMAPS I - PROGRAM DISK

10. You should now store the distribution diskettes in a
     safe place away from the site where the system is
     installed. Use the backup copies for all of the work
     that follows.

SETTING SYSTEM TIME AND DATE

It is very important to have both time and date correctly
set, since the software creates a new data file each calendar
day of operation. If the system is operating continuously,
the software will pause briefly at midnight to create a new
data file. Remember to use 24-hour time format. If it is
after noon, then add 12-hours to the standard time. For
instance, 4:00 in the afternoon should be entered as 16:00.
Failure to do this properly now can lead to file problems in
the future.

If you have a PC/AT system then use the SETUP program that
came with your system to set Time and Date.

If you have a PC or PC/XT, enter the command to suit the real
time clock card installed. For instance, with the AST "Six-
Pack" card installed, type "SETCLOCK" and press [<--'].
Don't type the " " marks, just the characters inside. This
will load the program to set the real time clock on the AST
SIXPAK board.

If the date was wrong, type "DATE" and press [<--']. Then
enter the current date in the format: "MM-DD-YY" and press
[<--']. If the time was wrong, type "TIME" and press [<--'].
Enter the current time in the format "HH:MM" or "HH:MM:SS".
You must use "24-hour" format when entering time. You can
set the clock to the nearest second if you want, or just set
to the nearest minute:
If it is 4:30 in the afternoon, you should enter "16:30".
If it is 8:22 in the morning, you should enter "08:22".
If you want to set the clock to the exact second, then input
the time for the start of the next minute using the HH:MM:SS
format:
For instance, if it is 16:30:35, you should enter "16:31:00".
Wait until the minute changes before you press [<--'] to set
the system time to the new value.

When the time and date have been set you must "BOOT" the
system to make the changes permanent. Press and hold down
[Ctrl] and [Alt] with the left hand, and then press [Del]
with the right hand.

The combination of keys is often shown as:

                         [Ctrl-Alt-Del]

INSTALLATION OF THE SOFTWARE ON THE HARD DISK:

If the C:> prompt is not displayed, boot the system as
described above. You should now see the C:> prompt.

Place the BACKUP copy of the CLIMAPS INSTALL diskette in
drive "A:" and close the door. Type "A:" and press [<--'].
You should now see the "A:>" prompt indicating that drive A:
is the logged drive. Type INSTALL and press the [Enter] key.

Follow the instructions on the screen to install the software
on C:. The software will normally be installed on C:, so you
can accept the default drive when presented if this is your
choice.

The default directory is \CLIMAPS1. You may accept this
default, or key in another directory name if you wish. In
either case, if the directory already exists, you will be so

advised and asked if you still want to use it. Once you have
confirmed a directory name, the CLIMAPS Utility and Data
files will be copied to the hard disk. Then you will be
asked to place the CLIMAPS PROGRAM diskette in drive A: so
that the program files can be copied to the hard disk.

The installation will finish with the running of the CLIMAPS
software. You will first see the large CLIMAPS logo, and
then shortly, the Main Menu. Before you do anything else,
select SYSTEM CONFIGURATION and set the various parameters to
suit the hardware combination that you are using.

SYSTEM CONFIGURATION

Before you can use the CLIMAPS software, you must "CONFIGURE"
the SOFTWARE to match the way you have set up your HARDWARE.
In the process you will be telling the software exactly how
you want it to work and where you want it to store the data
that the system will acquire and process. All of the
information will be stored in a "CONFIG" file on the hard
disk.

From the MAIN MENU select:

7. SYSTEM CONFIGURATION

The following screen will appear shortly:

```
+-------------------------------------------------+
|                                                 |
|            SYSTEM CONFIGURATION                 |
|                                                 |
|         SCREEN GRAPHICS........ N               |
|         PLOTTER INCLUDED....... N               |
|         PLOTTER CONNECTED TO..  LPT1:           |
|         DATA SAVED TO DRIVE...  C:              |
|         NUMBER OF SENSORS.....  1               |
|         SENSOR No. 1 TYPE.....  CI-8060         |
|         SENSOR No. 2 TYPE.....                  |
|         BAUD RATE............  9600             |
|         MONITOR TYPE.........   EGA             |
|         TIME DELAY AT STARTUP.  4 MINUTES       |
|         SCREEN TIME DISPLAY...  12-HR           |
|         DATE DISPLAY FORMAT...  MM/DD/YY         |
|                                                 |
|         PRESS -->| TO CHANGE AN ITEM            |
|         PRESS <--' TO MOVE TO NEXT ITEM         |
|         PRESS Esc  FOR PREVIOUS ITEM            |
|                                                 |
+-------------------------------------------------+
```

You may move up and down the list with [Esc] and [<--'].
The proper parameters for each statement are stored in the

system - you select the one that you want by pressing [-->¦]
to switch or toggle between the available answers.
Each item on the list is explained separately below:

SCREEN GRAPHICS

There are only two possible answers, "N", for No, and "Y" for
Yes. Press [-->¦] and notice that the highlighted text will
toggle between "N" and "Y". If you have a CGA or EGA card
installed in your computer or if you have a COMPAQ computer
with a MONO monitor and if you want to see graphs displayed
on the screen before being printed, set this item to "Y".
You may set this item to "N" with a color card installed to
disable the screen display of graphs. If you have an IBM-PC
with a Monochrome video board and monitor system installed,
it makes no difference how you set this item, since the
software will check to see what kind of video board is
installed and will not attempt to display graphics on an IBM
MONO system.

Press [<--'] to move down to the next line.

PLOTTER INCLUDED

There are only two possible answers for this one, "Y" for Yes
and "N" for No. If you have set up your system with the
EPSON HI-80 Plotter, set this item to "Y", otherwise, "N".
It is important to do this right in order to avoid confusion
later on. If you configure the system to include a plotter,
the MAIN MENU will be changed to include the plotter option.
If you set this item to "Y" and don't really have a plotter,
the system will try to output plotter code to the printer and
the results will be of no use at all, and a total waste of
time.

Press [<--'] to move down to the next line.

PLOTTER CONNECTED TO..

Only two answers are possible here, "LPT1:" and "LPT2:". If
you have not answered "Y" to the PLOTTER INCLUDED line, it
makes no difference how this item is set, and you should
press [<--'] to move on.

If you have set up your hardware with two parallel ports, the
printer must be connected to "LPT1:" and the plotter must be
connected to "LPT2:" so you must set this item to "LPT2:".

However, if you have only one parallel port and want to
connect the plotter you must use an "A-B" printer selector
switch. The switch input should be connected to "LPT1:", the
printer should be connected to output "A" and the plotter
should be connected to output "B". In this case, set this
line to "LPT1:".

Press [<--'] to move down to the next line.

DATA SAVED TO DRIVE.. []

You must tell the system where you want to store the data
that is acquired from the instruments. The software will
allow you to select any drive from "A:" to "E:" for this
purpose.

You should initially set the data drive to the hard drive
where you have installed the software. Later on, if a
special situation develops where you want to perform some
tests with the data saved to a floppy diskette, you can run
CONFIG before the start of the tests and set the data drive
to A: or B:. After the tests are complete you can again run
CONFIG and change the data drive back to the hard disk.

To summarize:

C: should be selected if the software is installed on a
typical hard drive system.

D: should be selected if the software is installed on a hard
drive system with the hard drive designated as "D:".

E: should be selected if the software is installed on a hard
drive system with the hard drive designated as "E:".

A: or B: may be selected for special situations where data
files must be saved to a floppy diskette.

Press [<--'] to move down to the next line.

NUMBER OF SENSORS

You can specify either "1" or "2" sensors. As you press the
[-->|] key, the number will toggle between the two possible
answers. Be sure that you set the system to the number of
sensors that you plan to use. Please note that if you set
the system for 2 sensors and have only installed 1 serial
port in the computer, the data acquisition module will refuse
to run until you get it right. In the MAP module if you try
to draw a MAP and specify data box information for a 2 sensor
system without first setting the number of sensors to "2" you
will be unable to specify any of the data boxes that should
have sensor No. 2 information. The only satisfactory way is
to get it right "up front" and everything else will most
likely fall right into place.

Press [<--'] to move down to the next line.

SENSOR No. 1 TYPE

There are 6 possible answers: CI-8060, CI-6300, CI-6400, plus
CI-7300, CI-7400, and CI-7500. As you press the [-->|] key
the system will toggle through these six answers. Be sure to
set this item to indicate what you will be using for sensor
No. 1. The MAP module uses this information in determining
channel size descriptors. (These descriptors are different
for each of the available sensors)

Press [<--'] to move down to the next line.

SENSOR No. 2 TYPE

There are 7 possible answers: CI-8060, CI-6300, CI-6400,
plus CI-7300, CI-7400, CI-7500, and "   ". As you press the
[-->|] key repeatedly the system will run through all 7
possible answers. Be sure to set this item to indicate what
you will be using for sensor No. 2. The MAP module uses this
information in determining channel size descriptors. (These
descriptors are different for each of the available sensors)

Press [<--'] to move down to the next line.

BAUD RATE

"BAUD RATE" is a term that refers to the speed at which
information is transmitted. The highest rate that you can
specify is 9600, and the lowest is 300. The CI-8060 and
CI-6300 particle counters normally leave the factory with
BAUD rate set at 9600. The rate is determined by the setting
of 3 DIP switches inside the particle counter. Refer to page
17 of the CI-8060 MANUAL or page 28 of the CI-6300 MANUAL.
For 9600 BAUD, positions 1, 2, and 3 should all be closed.
Switch settings are listed in the manuals for several rates
that are not available with this software. If you change the
switch settings please be sure to set the rate for one of the
following: 300, 1200, 2400, 4800, 9600 BAUD. If you have 2
sensors the BAUD rate must be set the same for both. You
should start with the 9600 setting if you have a relatively
short run of cable between the instruments and the computer.
If the cable gets longer than 50 feet you should use a lower
rate.

For maximum operating efficiency you should use a rate that
is as high as will permit problem free communications. If
you seem to be having periodic data transmission problems,
you should try lowering the BAUD rate one step.

Press [<--'] to move down to the next line.

MONITOR TYPE

There are 3 possible answers: **MON**, **CGA**, and **EGA**.

Select **MON** if you have a Monochrome Monitor. The system will
determine whether or not to display screen graphics by the
setting of SCREEN GRAPHICS parameter.

Select CGA if you have a standard color-graphics adaptor and
monitor installed. This selection will only produce low
resolution text and graphics even if you actually have a high
resolution EGA card installed, so be careful how you make
your choice.

Select **EGA** if you have either an **EGA** or **VGA** color-graphics
card and monitor installed. With this selection, graphics
will automatically be displayed in 640 x 350 pixel enhanced
resolution and text in 80 x 25 format with a character box
size of 8x14.

Press [<--'] to move down to the next line.

TIME DELAY AT STARTUP

Electronic and electro-mechanical equipment frequently needs
a short period after turning on the power to warm up and get
stabilized. In addition, airborne particle sampling systems
should be run long enough to purge out the sample lines
before data acquisition starts. You can set an automatic
startup delay of from 2 to 5-minutes. Press the [-->|] key
until the desired delay time is displayed. Although it is
not possible to set a delay time of "0" in the CONFIG file,
you will be able to run the system with 0-minutes delay if
that is your wish. (See page 3-1).

Press [<--'] to move down to the next line.

SCREEN TIME DISPLAY

You can select either 12-hour or 24-hour format for display
of time on the screen. The computer uses the 24-hour format
internally as you might remember from setting the system
clock. However many people prefer the 12-hour format with a
suffix of AM or PM to indicate before or after noon. Select
either format by pressing [-->|] until the desired format is
displayed.

DATE DISPLAY FORMAT

Although we typically display the date in the **MM/DD/YY** format
in the United States, it is common practice in many other
countries to use the **DD/MM/YY** format. You may select either
one and it will become the standard for all screens and
reports that include the date.

CAUTION: Filenames for the daily data files are generated
automatically using the date format in effect at the time the
data is captured.   Also, some complex date arithmetic is
used in managing these data files and sorting for the INDEX
File.   Once you have set the Date format and generated some
Daily data files, please be very careful not to change the
format without completely erasing all Daily data files and
the INDEX File.   Failure to observe this caution could result
in a system error and a jumbled set of files. If you suspect
that this might have happened by accident, you should first
run CONFIG and set the date format back the way it should be
and then run the System Utilities to Update the Index File.
(See page 8-3)

Press [<--'] and the following message will be displayed:

DO YOU WANT TO CHANGE CHANNEL SIZE DESCRIPTORS? (Y/N)

If you answer anything but "Y", the following message will be
displayed:

RETURN TO MAIN MENU .. OK ? (Y/N)

If you answer "Y" to this question the system will return to
the MAIN MENU, otherwise system will return to the beginning
configuration screen.

```
┌─────────────────────────────────────────────────────────┐
│                 CHANGE SIZE DESCRIPTORS                   │
│                                                          │
│         1 - CHANNEL SIZES FOR SENSOR No. 1               │
│         2 - CHANNEL SIZES FOR SENSOR No. 2               │
│         Esc  RETURN TO MAIN MENU                         │
│                                                          │
└─────────────────────────────────────────────────────────┘
```

From this screen you can elect to change the size descriptors
for either sensor. When finished, press [Esc] to return to
the MAIN MENU.

CHANGE CHANNEL SIZE DESCRIPTORS

As distributed, the software has channel size descriptors for
the CI-7300 in the Sensor No.1 file, and for the CI-7400 in
the Sensor No. 2 file. In this way, if you are going to set
up a two-sensor system the chances are pretty good that the
channel descriptors in one of the files are correct as
received. To help you in case you want to change one or both
of these files, suggested descriptors for the six available
sensors are listed below:

Channel	CI-7300 (CI-8060)	CI-7400 (CI-6300)	CI-7500 (CI-6400)
1	0.3u	0.19u	0.10u
2	0.5u	0.3u	0.15u
3	0.7u	0.5u	0.17u
4	1.0u	1.0u	0.20u
5	5.0u	3.0u	0.30u
6	10.0u	5.0u	0.50u
7	TEMP	TEMP	TEMP
8	RH%	RH%	RH%
9*	VEL	VEL	VEL
10*	AUX	AUX	AUX

    * These channels only appear for the 7000 series.

You can actually enter anything that will fit into the
5-character field, and there may be situations where you will
want to deviate from these standards. Be aware that the size
descriptors specified here will be used by all of the system
modules for screen display, reports, graphs, plots, etc.

BATCH FILES

During the installation, a pair of BATCH Files were created
in the Root directory of the hard disk:

> The file **CLIMAPS.BAT** will let you run the CLIMAPS
> software from any directory on the hard disk if you
> have the PATH properly set.

> The file **AUTOEXEC.CLI** is a sample file included to
> illustrate how an AUTOEXEC.BAT file should be set up
> to include the needed PATH definition. You can use
> this file as a model to create your own AUTOEXEC.BAT
> file, or you can simply RENAME it with the following
> command from the C:> prompt:

> ### REN AUTOEXEC.CLI AUTOEXEC.BAT

If you have a PC/AT, the time and date are stored in a
special section of the battery-backed EPROM memory, and will
be automatically set each time you turn on the system.

However, if you have a PC or PC/XT system, the hardware
requirements specify that you must have a real time clock
card installed, and you must include a line in your
AUTOEXEC.BAT file to access the clock card and get the
current time and date.

Please be very careful to make sure that this job is properly
taken care of and the battery on the card is maintained in
proper condition. The data file management portion of the
software depends on the system date and time for the
automatic creation of all new Daily data files. If you allow
any errors to creep into the system as far as date and time
are concerned, your data files will be about as useful as a
pile of garbage.

A typical AUTOEXEC.BAT file for a PC/AT should look something
like this:

```
echo off
cls
path c:\
prompt $p$g $a
climaps
```

An AUTOEXEC.BAT file for a PC or PC/XT should have the same
contents plus a line to access the system clock:

```
echo off
cls
getclock
path c:\
prompt $p$g $a
climaps
```

The command getclock will access the real time clock on the
AST 6-pack card.   A substitute command commonly used with
generic cards is: timer/s.   Whatever you use, please check it
out carefully and make sure that it is absolutely correct
before starting actual use of the software.

THE MAIN MENU is the first screen that you will see each time
you power up the system. It serves to integrate all of the
functional program modules into one easy to use package. Each
item on the MAIN MENU is the key to loading a module of your
choice.

```
┌─────────────────────────────────────────────────┐
│                                                  │
│               MENU OF APPLICATIONS               │
│               CLIMAPS   Release 2.1              │
│                                                  │
│                                                  │
│           1. ACQUIRE DATA                        │
│           2. DRAW/REVISE MAPS                    │
│           3. PRINT REPORTS                       │
│           4. GRAPHS ON PRINTER                   │
│           5. GRAPHS ON PLOTTER                   │
│           6. CHECK INSTRUMENTATION               │
│           7. SYSTEM CONFIGURATION                │
│           8. FILE UTILITIES                      │
│         Esc  END THIS SESSION                    │
│                                                  │
│           PRESS THE NUMBER OF YOUR CHOICE        │
│                                                  │
└─────────────────────────────────────────────────┘
```

Press the number of your selection and the module will be
loaded automatically. In the CLIMAPS system, all single
character entries are auto-executing so all you have to is
press the key briefly.

As soon as a new module is loaded, the first screen will list
all of the functions that can be performed by the module. The
functions may be listed in another "sub MENU" or displayed on
the STATUS LINE. In either case, the number of items to
select from will be small enough so that you should have no
difficulty in deciding which function to use. All menus are
presented as a numbered list, except for the last item which
is always [Esc].

[Esc]

In each program module, when you select [Esc] from the MENU
the system will return to the MAIN MENU so that you can
choose another program function. If you have no further work
to do, select the last item on the MAIN MENU:

                    "END THE SESSION"

By pressing the [Esc] key. Notice that the system has a
built-in "safety net" to rescue you in case you press the key
by accident. The screen will clear and then display the
following message:

YOU HAVE ELECTED TO END THIS SESSION

DO YOU WANT TO DO THIS? (Y/N)

If you answer anything but "Y" the system will return to the
MAIN MENU for another try.

DATA ACQUISITION

The function of the Data Acquisition module is to receive raw
data from the instrumentation, process it, store it on disk
for future use, and display selected portions of it on the
video screen. Only 3 functions are available on the MENU:

```
        1 - ACQUIRE AND DISPLAY DATA
        2 - MARK A DATA BLOCK
        Esc  RETURN TO MAIN MENU
```

1 - ACQUIRE AND DISPLAY DATA

Prompt: IF THIS IS A COLD START YOU MUST ALLOW ABOUT
               []-MINUTES FOR INSTRUMENTATION WARM-UP.
               TIMING WILL BE AUTOMATIC AND WILL BEGIN AS
               SOON AS YOU MAKE A SELECTION BELOW.

               IS THIS A COLD START? (Y/N)

One of the items specified in the system CONFIG file was the
"TIME DELAY AT STARTUP". You had to set the delay between 2
and 5-minutes. The delay timer is included in the system to
provide a controlled period of time between turning on the
power to the instrumentation and start of data acquisition.
Very often the first few blocks of data are erratic and of
little value. The delay period allows a specific amount of
time for the instrumentation to warm up and stabilize and the
sample lines to purge. You are not forced to use the timer -
you can always answer "N" to the question and go directly to
data acquisition. It is up to you to decide how you want to
use this feature.

If you answer "Y" to the question, the screen will display:

               CURRENT SYSTEM TIME:..... HH:MM:SS
               PROCESSING WILL BEGIN AT: HH:MM:SS

The display will then work as a digital clock, updating the
system time each second. When the system is ready for
processing to begin, the screen will clear and the ZONE INDEX
will be displayed.

ZONE INDEX

The ZONE INDEX lists all MAPS that have been created and are
available for use. If there are no MAPS on file, the ZONE
INDEX will be blank so it should be obvious that you cannot
proceed. The only way out of this situation is "OOPS" -

press [Esc] to return to the MENU as indicated on the status
line. (See Fig. 3.1)   There are three sample MAPS included
on the software distribution diskette, so this type of thing
won't happen unless you use the DELETE function of the MAP
module to delete them from the file.

ZONE MAP INDEX			
ZONE A SENSOR#1, PORT#1	ZONE B SENSOR#2, PORT#1		
ZONE Q 2-SENSOR 1-PORT			

Fig 3.1

Prompt: PLEASE ENTER ONE OF THE LISTED ZONES

The ZONE INDEX is provided so that you can select a map for
display as data acquisition takes place. It is not critical
which map you choose to display at this time, but you might
as well select one that has data fields of high interest.
For instance if your primary interest is in tracking 0.3u
particle counts at several locations, you should select a map
that has been set up to display this information. (The map on
display can be changed later with a single keystroke.)

Figure 3.2 illustrates how a typical Map will look when
displayed for data acquisition. There is a large amount of
information on the screen and each bit has significance. If
you have any problems understanding what everything means,
then first study Figure 3.2 and then refer to the detailed
information that follows. Each item on the screen will be
explained to give you a better feel for how everything ties
together.

```
ZONE 0:  2-SENSOR 1-PORT      F3  COUNTS/HI ALARM
                                      YOUR COMPANY NAME PRINTED HERE --     F4 -PrntScrn
     SENSOR #1                     SENSOR #1             SENSOR #2
  ┌──────────────────┐        ┌──────────────────┐    ┌──────────────────┐
  │ CHAN #1    .3u   │        │ TEMPERATURE  ℉   │    │ CHAN #1    .19u  │
  │ 578194 / 600000  │        │   53.2 /  68.0   │    │ 300296 /1100000  │
  ├──────────────────┤        ├──────────────────┤    ├──────────────────┤
  │ CHAN #2    .5u   │        │ REL HUMIDITY %   │    │ CHAN #2    .3u   │
  │ 140632 / 150000  │        │   54.4 /  62.0   │    │ 37914 / 450000   │
  ├──────────────────┤        └──────────────────┘    ├──────────────────┤
  │ CHAN #3    .7u   │                                 │ CHAN #3    .5u   │
  │ 12163 /  15000   │                                 │ 2638 / 140000    │
  ├──────────────────┤                                 ├──────────────────┤
  │ CHAN #4    1u    │        SENSOR #2                 │ CHAN #4    1u    │
  │   290 /   300    │                                 │  147 /  15000    │
  ├──────────────────┤        ┌──────────────────┐    ├──────────────────┤
  │ CHAN #5    5u    │        │ TEMPERATURE  ℉   │    │ CHAN #5    3u    │
  │     0 /    25    │        │   50.8 /  70.0   │    │    2 /  2500     │
  ├──────────────────┤        ├──────────────────┤    ├──────────────────┤
  │ CHAN #6    10u   │        │ REL HUMIDITY %   │    │ CHAN #6    5u    │
  │     0 /    10    │        │   54.8 /  68.0   │    │    0 /    50     │
  └──────────────────┘        └──────────────────┘    └──────────────────┘
ZONE MAPS: AUO
F1 STOP   SENSOR #1 DATA:            SATURDAY  JANUARY 25, 1986 04:34:00
                                                        F6  ZONE INDEX
```
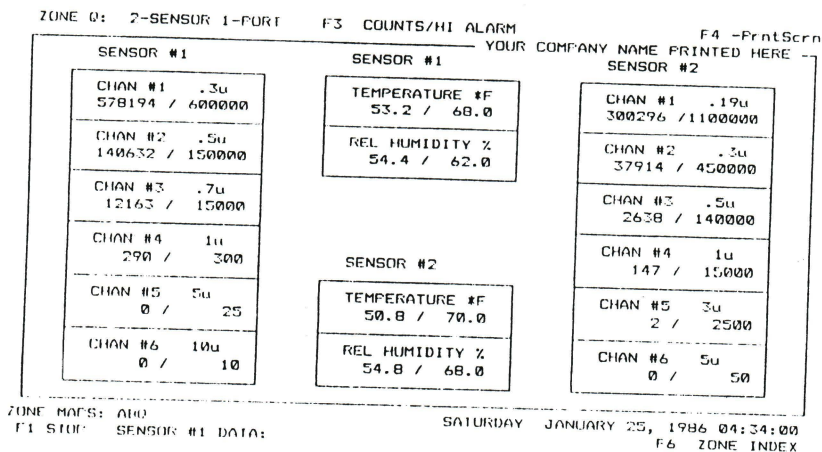
Fig. 3.2

Figure 3.2 represents a typical MAP on display during data
acquisition. The information will change as new data is
acquired, and as you press the various function keys. The
following text will briefly explain the reason for an item to
be displayed and then explain the meaning of the item:

F1 STOP

As a program is running you need some way to stop so that you
can do something else. Data acquisition is pretty much a
continuous process, but there will be times when you want to
stop the process - perhaps to print a data dump or print a
graph, or change the system configuration, or even, stop
because the work day is over.

What it means: Any time that "F1 STOP" is displayed at the
left of the status line you may press [F1] to stop data
acquisition. A system of double checking - a "safety net" so
to speak - is used to make sure that you really want to stop.
Data acquisition doesn't actually stop the moment you press
[F1]. Instead, the message changes to a flashing "F9 MENU".

The message will continue to flash for about 5-seconds. If
you fail to press [F9] during that period, the message will
simply return to the original "F1 STOP" and nothing will have
happened at all to affect data acquisition.

If [F9] is pressed while the flashing message is displayed,
data acquisition will be terminated and you will be returned
to the MENU to select a desired action.

F3 COUNTS/HI ALARM

You will see this message at the center of the top line on
the screen each time you display the first MAP.

What it means: In each data box on the screen the latest
count is displayed to the left of the "/" and HIGH CRITICAL
or "HI ALARM" value for that item is displayed to the right
of the "/". If the data in a data box is flashing it means
that the current count has exceeded the HIGH CRITICAL level.

If you want to change the display format, press [F3] and the
message will change:

F3 COUNTS/LO ALARM

There are five possible formats for display of data. This
format always follows "COUNTS/HI ALARM".

What it means: In each of the data boxes, the latest count
is displayed to the left of the "/". The "LOW CRITICAL"   or
"LO ALARM" value is displayed to the right of the "/". If
the data in a data box is flashing it means that the current
count has gone below the LOW CRITICAL level.

LO ALARM values have essentially no meaning for channels 1
through 6 because although you can assign a value to these
channels when you draw a MAP and input the specifications,
the value should be "0.0". This display format should be
selected when you want to display the latest values for the
Temperature, Relative Humidity, Air Velocity, and AUX
channels compared to their LOW CRITICAL values.

If you want to change the display format, press [F3] and the
message will change:

F3 COUNTS/HI WARN

When you draw a MAP and input specifications you can specify
a "HIGH WARNING" or "HI WARN" value for each data box.

What it means: In each of the data boxes, the latest count
is displayed to the left of the "/". The "HIGH WARNING"
value is displayed to the right of the "/". This display
format should be selected when you are interested in tracking

3-4

counts as compared to their HIGH WARNING levels. If the data
in a data box is flashing it means that the current count has
exceeded the HIGH WARNING limit.

If you want to change the display format, press [F3] and the
message will change:

F3 COUNTS/LO WARN

When you draw a MAP and input specifications you can specify
a "LOW WARNING" or "LO WARN" value for a data box containing
temperature or relative humidity data.

What it means: In each of the data boxes, the latest count
is displayed to the left of the "/". The "LOW WARNING" or
"LO WARN" value is displayed to the right of the "/". If the
data in a data box is flashing it means that the count has
gone below the LOW WARNING level.

LO WARNING values have essentially no meaning for channels 1
through 6 because although you can assign a value to these
channels when you draw a MAP and input the specifications, it
should be "0.0". This display format should be selected when
you want to display the latest values for Temperature,
Relative Humidity, Air Velocity and AUX compared to their LOW
WARNING values.

If you want to change the display format, press [F3] and the
message will change:

F3 COUNTS/MOV AVER   /=M.A +10%

As each block of data is received from the instrumentation it
is combined with the information already collected to compute
a "MOVING AVERAGE" for each data item.

What it means: In each of the data boxes, the latest count
is displayed to the left of the "/". The "MOVING AVERAGE"
is displayed to the right of the "/". This display format
should be selected when you are interested in tracking counts
as compared to their average value for the current session of
data acquisition. The right part of the message, "/=M.A.
+10%" is highlighted to indicate that if the data in a data
box is flashing then the current value exceeds the MOVING
AVERAGE by 10% or more. You can use this feature to identify
those data items that have large periodic fluctuations.

If you want to change the display format, press [F3] and the
message will change back to the original "COUNTS/HI ALARM".

USING [F3]

As data acquisition proceeds, note that the "F3" portion of
the message at the top center of the screen is not always
displayed. The reason for this is that during certain
critical parts of the processing we do not want the display
format to be changed. You can press [F3] if you want to, but
nothing will happen. Just wait a few seconds until you see
the "F3" displayed again and then proceed.

F4 -PrntScrn

This message is displayed at the upper right corner of the
screen to let you know that you can print a copy of the
screen by pressing [F4]. You will find this "Print Screen"
function available in several of the system modules.

What it means: On occasion you may want to "Take a Snapshot"
of the screen as it is at a certain point. The [F4] key is
enabled continuously in the data acquisition module, and you
may use it at any time that suits your needs. As soon as you
press [F4] the status line will clear and this message will
be displayed on the status line:

SAVING SCREEN FOR DUMP TO PRINTER -- PLEASE DO NOT DISTURB

Before the screen can be printed, all of the information on
it must be stored so that printing can take place while the
program gets back to data acquisition. The message on the
status line will not be included in the information sent to
the printer.

F6 ZONE INDEX

The ZONE INDEX was displayed at the start of data acquisition
so that you could select a MAP for display. After a period
of data collection, the ZONE INDEX takes on an additional
function.

What it means: Press [F6] to display the ZONE INDEX. Now,
however, if the data in a ZONE is flashing it means that an
alarm exists for that zone. This is a very important feature
of the software, since it enables you to quickly determine
the status of each item in the large data mass.

Each data box in each MAP on file is checked to determine if
an alarm violation has occurred with the current block of
data. If any violations are found, whether HIGH CRITICAL,
HIGH WARNING, LOW CRITICAL, or LOW WARNING, the ZONE that
contains that box is set to flashing. The ZONE will continue
to flash until a block of data is received that does not
violate any of the alarm settings for the ZONE.

It is possible for a single data item to set the data

flashing for more than one ZONE. For instance, you might
want to display the Temperature as found with Sensor No.1,
Port No. 1 on more than one ZONE MAPS for reference purposes.
If they all have the same alarm level, and if the Temperature
violates that alarm, then the data in all of the ZONES with
this item specified will be set to flashing.

While the Zone Index is displayed you will see the following
displayed in the lower left corner of the screen:

                     PRESS A ZONE LETTER FOR DATA

Press the letter of any MAP shown on the INDEX and the
screen will change to display the selected MAP. Now, the
following will be displayed in the lower right corner of the
screen:

                          F6 ZONE INDEX

Press [F6] if you want to return to the ZONE INDEX display.

Thus, you can freely change the display back and forth
between the ZONE INDEX and a MAP of your choice. ₁ At times
you may note a short delay between pressing a key and the
change actually taking place. This is because all functions
are assigned a priority, and the display change ranks quite
low on the list. If there is more important work for the
system to do at the instant that you press a key, the
software will remember your instruction and make the change
as soon as processing time is available.

ZONE MAPS: ABQ

While a MAP is displayed, this message is displayed at the
left of the line just above the status line to indicate the
ZONES with MAPS available for display. You can call up a new
MAP by pressing the key for one of the displayed characters.
If you press a key for a MAP that doesn't exist, the system
will just ignore the entry.

When you call up a new MAP it may not be displayed instantly,
but please, only press the key once. The system remembers
keystrokes, and if you press a key more than once the system
will display the MAP the same number of times before it
settles down.

Once you have the desired MAP on the screen you can use [F3]
to page through the 5 different data formats until you see a
screen with one or more flashing data fields to indicate that
an alarm condition exists.

ALARM PRESS [F2] TO ACKNOWLEDGE

During data acquisition, as new data is collected it is
compared to the alarm level set for each data box on every
MAP on file. If any alarm level has been exceeded (whether
the MAP is currently displayed or not) this message will
appear on the line just above the status line. The message
will remain until you press [F2] to acknowledge that you have
seen it. If the printer is turned on and "ON LINE", a short
report will be printed to document the time and details of
the event.

What it means: On occasion, a count may exceed an alarm
level for a short period of time and could go unnoticed
unless a means is provided for detecting and remembering the
incident. The ALARM notice on the screen plus the printed
report gives double coverage. It is recommended that you
leave the printer ON LINE during data acquisition. If an
alarm message is displayed, you can first tear off the
printed ALARM REPORT and pass it on to the person responsible
for corrective action. Then press [F2] to acknowledge
receipt of the Alarm Message and clear the message from the
screen.

If an ALARM condition persists, you may want to take the
printer OFF LINE until the situation is corrected, but
remember, if an alarm violation happens in another zone while
the printer is OFF LINE no report will be printed.

SENSOR #1 DATA:

While in the data acquisition mode the system spends most of
the time waiting for data to be transmitted from the particle
counter/monitor.

What it means: This message on the status line means that
the system is awaiting data for SENSOR #1. If you have a
system with 2 sensors the message will alternate between
SENSOR #1 and SENSOR #2. The message may remain on the screen
for as long as 5 or 6 minutes if you have set MODE on the
instrumentation to provide this length of time between data
transmissions. Acquisition and processing of a data block
takes only a few seconds and as soon as the screen has been
updated with the new data the system returns to the job of
waiting for a new block of data to be received. It is during
these waiting periods that all of the other activities
described earlier in this section can take place.

MAP MODULE

The CLIMAPS System will automatically capture and process the
data stream from one or two Climet Airborne Particle Counters
with up to 30 ports each from optional CI-310 multiport
samplers. Each port can have ten channels of data:
(6 channels of particle counts + Temp, RH, Air Vel, and AUX).
Thus, it is possible to track up to 600 different values. If
all of this information were to be displayed on the screen at
once it would be almost impossible to use, so the program
employs a mapping technique that allows you to display a
portion of the total data mass on the screen at a given time,
and then select another portion as the need arises.

The MAP MODULE will let you organize the individual screens
in any way that suits your needs. You can create a total of
24 individual maps or screens, and each may contain up to 18
data "boxes". Each data box contains a label of your choice
and a single data item which you specify after the map has
been drawn. The screens may be simple or complex, as you
wish. For instance you may create a map for each port and
simply display the 6 channels of particle counts plus Temp,
RH, Air and AUX. Or, you may divide the total area being
monitored into a number of smaller areas and then create a
map for each small area showing data boxes in their relative
position "flow chart" style, interconnected with lines to
represent process flow. If each box represents a different
port, you may display the status of one channel each from as
many as 18 different ports or locations on a single screen.
In clean room monitoring for example, you might display the
most recent count of 0.3 micron particles for as many as 18
different sampling locations .

GRAPHICS ON THE PC SCREEN

The IBM PC has a set of "quasi-graphic" characters that can
be used for drawing high-resolution lines and boxes with
either the Color-graphics adaptor or the Monochrome adaptor.
The MAP MODULE makes it easy for you to use these characters
by re-defining several different keys. Refer to Fig.4.1 and
compare it to the layout of
the keypad. While in the DRAW
mode the keys [1] thru [9] are
re-defined to draw the corner
or intersection detail next to
the corresponding number in
the figure. Horizontal lines
are drawn by pressing [H], and
you get vertical lines with
[V]. While the program is in
the DRAW mode these keys are
re-defined, and displayed on
the status line at the bottom
of the screen.

```
┌─────────────────────────────┐
│                             │
│   7 ┌    8 ┬    9 ┐         │
│                             │
│   4 ├    5 ┼    6 ┤         │
│                             │
│   1 └    2 ┴    3 ┘         │
│           .                 │
└─────────────────────────────┘
```
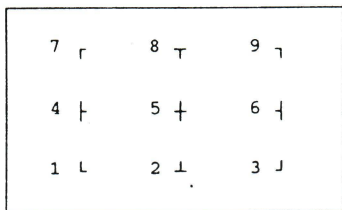
            Fig 4.1

The keypad on the IBM-PC can be toggled to function either as
a numerical pad or as a cursor control pad. You can change
the function at any time by pressing [Num-Lock], however, the
CLIMAPS System does this job for you. Each time you shift
into the DRAW mode the keypad is automatically toggled to the
"CURSOR" mode. If you have a keyboard with dedicated cursor
keys, this feature offers no particular advantage, but it
does no harm either.

The easiest way to draw is to use the four arrow keys to move
the cursor to the spot on the screen where you want to begin.
If you want to draw one of the special corner or intersection
details, use the [SHIFT] key and one of the number keys on
the keypad. This method is highly recommended because it
leaves the key pad in cursor mode. Press [H] to draw a
horizontal line or [V] to draw a vertical line. The keys
repeat, so just hold one down until you have drawn a line of
the desired length.

USING THE MAP MODULE

From the MAIN MENU, select "DRAW/REVISE MAPS". After the MAP
MODULE loads, the opening screen will be the ZONE MAP INDEX:

ZONE MAP INDEX			
ZONE A SENSOR#1, PORT#1	ZONE B	ZONE C	ZONE D
ZONE E	ZONE F	ZONE G	ZONE H
ZONE I	ZONE J	ZONE K	ZONE L
ZONE M	ZONE N	ZONE O	ZONE P
ZONE Q 2-SENSOR 1-PORT	ZONE R	ZONE S	ZONE T
ZONE U	ZONE V	ZONE W	ZONE X

1-DRAW/REVISE   2-DISPLAY   3-REPLICATE   4-DELETE   5-ZONE SPECS   Esc -EXIT

Fig. 4.2

You may select any of the six options displayed on the status
line by pressing the key that matches your choice. Execution
of your selection will begin as soon as you press the key.

1-DRAW/REVISE

Selection of this option will bring up a new status line:

    1-DRAW NEW MAP   2-REVISE EXISTING MAP

1-DRAW NEW MAP

Prompt: DRAW A MAP FOR ZONE .....

The ZONE INDEX consists of 24 boxes, each labeled with a
letter, A through X. If a map already exists for a Zone, the
information in the Zone Box will be highlighted to point this
out. If you enter the letter of a Zone with an existing map,
the system will caution:

         A MAP ALREADY EXISTS FOR ZONE [].......
         DO YOU WANT TO REPLACE THIS EXISTING MAP
         WITH A NEW ONE? (Y/N)

If you reply "Y", the system will answer:

              ARE YOU SURE?   (Y/N)

The double caution is used to reduce the chance of drawing
over an area MAP that you really want to keep.

When you elect to draw a new map and select a zone, the
system will ask:

         FEDERAL STANDARD 209D MAP (Y/N)?

If you reply "Y", some special instructions are presented and
the system is set up to prepare this special kind of Zone map
as described on page 4-13.

Prompt: LABEL FOR ZONE   [] (Where []=zone entered)

Enter a label to suit your needs. This label will be
displayed at the top of the screen each time you select this
zone for display or viewing. It will be displayed in a
highlighted block exactly as you enter it. If you want it to
be centered in the block, then space over as necessary. You
can use [<--] (above [<--']) to backspace and erase. If you
want a blank label, press [SPACE] and then [<--']. This key
sequence defines a label with a single character ("SPACE").

Prompt: AUTOMATIC BORDER (Y/N)

The default value is "Y". If you do not want a border around
this map, press "N". This option is given because the system
can draw the border much easier than you can. It is up to you

to decide when to use one. For instance, if you are drawing a
"flow-chart" type of map for a room, you can use the border
option to draw the outline of the room and then insert doors,
openings, etc. later on.

At this point the system shifts into the "DRAW" mode and the
"graphics" keys are re-defined and displayed on the status
line. Note that you now have a new cursor. While in the
"DRAW" mode a special cursor is used that straddles a
horizontal line. This makes it much easier to see where you
are on the map.
When the system shifted into "DRAW", the keypad was toggled
automatically into "cursor" mode. Move the cursor around the
screen using the four arrow keys. As you reach any of the
screen limits, (right, left, top, and bottom) the cursor will
"wrap around" to the opposite side. You can take advantage
off this feature if you are near one edge and want to move to
a point near the opposite edge. Just move the cursor to the
nearest edge and let it wrap around.

DRAW A SINGLE BOX

The cursor represents the upper left corner of a data box.
Press [S] to draw a single box. Note that this function is
indicated on the status line. As soon as the box has been
drawn, you will be asked to enter a label for the box. Note
that the system has temporarily shifted out of the "DRAW"
mode into "TEXT" mode with the normal cursor.

LABEL

The label may be any length from 0 to 16 characters, and will
be displayed later exactly as you enter it now. If you want
the label to be displayed centered in the data box, you must
enter it that way. You can use [<--] above [<--'] to back-
space and erase. When you have the label the way that you
want it, press [<--']. This is one routine that you cannot
exit with [Esc]. The system will not let you continue until
you have entered something to store as the label for this
data box. If you want a blank label, press [SPACE], [<--'].

As soon as the label is entered, the system will return to
the "DRAW" mode so that you can draw another box, draw some
lines, or most importantly, "SAVE" the screen.

DRAW A DOUBLE BOX

A double box is drawn by pressing [D]. Everything works
exactly the same as for a single box except you must now
enter two labels before you can continue. If you have
positioned the cursor so that there is insufficient room to
draw a double box, the system will "BEEP" to let you know.
When this happens, re-position the cursor to a satisfactory
location and press [D] again. Double boxes are provided so

that you can get maximum space utilization on the map. A
double box is just two single ones with a common side.

JOINING BOXES

You may draw boxes so as to share a common side by following
these simple rules:

1. Draw the upper box first.
2. Draw the left box first.
3. To join a box below an existing one, position the
   cursor at the lower left corner of the existing box
   before drawing the new one.
4. To join a box to the right of an existing one,
   position the cursor at the top right corner of the
   existing box before drawing the new one.
5. After joining boxes, you must go back and "patch" the
   joint by using the graphics keys. For this reason,
   you may decide to use joined boxes only when you have
   no other choice because of the number of boxes that
   you want to include on the map. You can get the
   maximum of 18 boxes on a map by drawing three columns
   of 6 boxes each, joined at top and bottom, with 2 or
   3 spaces between the vertical columns. The MAP for
   ZONE "Q", Fig.4.3, has two rows of 6 boxes each drawn
   in this manner.

ZONE Q: 2-SENSOR 1-PORT

		YOUR COMPANY NAME PRINTED HERE
SENSOR #1	SENSOR #1	SENSOR #2
CHAN #1 .3u	TEMPERATURE #F	CHAN #1 .19u
CHAN #2 .5u	REL HUMIDITY %	CHAN #2 .3u
CHAN #3 .7u		CHAN #3 .5u
CHAN #4 1u	SENSOR #2	CHAN #4 1u
CHAN #5 5u	TEMPERATURE #F	CHAN #5 3u
CHAN #6 10u	REL HUMIDITY %	CHAN #6 5u

F4 PRINT THIS SCREEN   ZONE LETTER   VIEW ANOTHER MAP   Esc ZONE INDEX

Fig. 4.3

Note that each time you draw a box and have entered a label,
the system returns to the "DRAW" mode. At this point, you
can draw another box, draw some lines or graphic details,

"SAVE" the map by pressing [F9], or press [Esc] to shift
into the "TEXT" mode.

DELETE A BOX

If you find that you have placed a data box in the wrong
position, or you have simply drawn more boxes than you
want, then press [F5] to delete the last box drawn. You can
in fact press [F5] repeatedly until all of the boxes have
been deleted. You should use this feature to practice with
the system -- perhaps look at several possible arrangements
for a planned map before doing the actual drawing. If you
press [F9] to Save a map with no data boxes, the system will
simply return you to the ZONE INDEX. This is one way that
you can exit the DRAW option if you have been practicing and
don't want to save a MAP - just use [F5] to delete all of the
boxes, and then [F9] to exit. (You may also exit with [F6]
from the TEXT mode).

DRAW LINES

In the "DRAW" mode, [H] will draw a horizontal line and [V]
will draw a vertical line. To draw a long line, hold the key
down until the line is as long as you want it. It is usually
best to stop a little short of the desired end point and make
the last few segments one at a time. If the line joins or
crosses another one, you can draw the necessary intersection
detail by using one of the number keys. Look at the status
line to determine which detail you need.

You can move to any screen location to edit the lines on a
map. You will even find that you can change or erase a data
box, but you must never do this except by using [F5] which is
provided for this purpose only. The location of each data
box is stored for use when a map is called later for display.
If you save a map with an altered data box, it will be
displayed exactly that way when recalled, but the data fields
will be printed in the correct locations whether the data box
is in the proper place or not.

TEXT MODE

This mode is used to add text information to the map. Note
on the status line that there are no re-defined keys active.
The system also has returned to the conventional cursor at
the bottom of the character position. You may enter as much
or as little text as you want, but you should use care to
avoid placing text within any of the data boxes. If you place
text within one of the data boxes, it will be overwritten
when the box is used to display data later on.

It is recommended that you draw all of the data boxes that
you need for a map before you start adding text. You should
soon discover that you can toggle back and forth between the

"DRAW" and "TEXT" modes at will by pressing "Esc", but you
must end up in the "DRAW" mode to SAVE a map.

F6 - START OVER

While in the text mode the status line will indicate that you
can "START OVER" by pressing [F6]. This is the "BAIL OUT"
key that you will need occasionally when you get a screen so
messed up that it would be easier to simply erase the whole
mess and start over. Keep this in mind when you think about
using [F6]. It means exactly what it says! When you press
[F6] the work on the screen will not be saved and you will be
returned to the MAP MENU.

SAVE A MAP

When you have finished drawing a map and have entered all of
the desired text, it should be saved on disk for recall
later. You must be in the "DRAW" mode to do this. You
should see "F9=SAVE" at the right on the status line.

As soon as you press [F9] the status line will change to:

                    SAVING SCREEN TO DISK

After a short pause you will observe some disk drive
activity, and if you are configured for CGA you will also
notice some "snow" on the screen. This is perfectly normal,
and nothing to worry about.   As soon as the map has been
saved the system will set up for specifications input for
each of the data boxes. A point worth mentioning is that due
to data integrity considerations once you have opted to draw
a map, you must input specs for each data box on the map.
For this reason if you are only experimenting with the system
to get a feel for the way that everything works, you might be
well advised to draw some practice maps with just a few data
boxes.

SPECIFICATIONS INPUT

After you have drawn a new map you must input specifications
for each data box.   The information that you input will tell
the computer all it needs to know about the data that is to
be displayed in each data box on a map.

                    SPECIFICATIONS FOR BOX NO. 1

Prompt: LABEL...... ¦_____¦

The label for each data box on the map will be displayed just
the way that you entered it in the DRAW mode. If you detect
an error in the way it was entered, you have an opportunity
to correct it. Just type over the old label if you want to
change it. If it is all right as it is, then press [<--'].

                              4-7

Prompt: SENSOR I.D..... |__|

Default is "1". You may have either 1 or 2 sensors connected
to the computer, and you must specify which one you want to
use for this data box. If you have only 1 sensor, then press
[<--'].

Prompt: PORT NO........ |__|

If you are working on a Fed. Std. 209D map the port No. is
assigned automatically. Otherwise, the default is "1". If
you have a CI-298 Multiport sampler connected to the sensor
specified above then you must specify which of the 12 sampler
ports will be used. If you have a CI-310 Multiport sampler
then you will have 30 ports available. If a CI-298 or CI-310
is not being used, then press [<--'].

Prompt: CHANNEL NUMBER (1 - 10) |__|

Each port collects data from as many as 10 channels.
(6 channels of Airborne particle counts + Temp. + R.H. + Air
Velocity + Aux) You must specify which channel of data you
want to use. As soon as you enter your choice, the system
will supply the matching channel descriptor from the CONFIG
file.

Prompt: HIGH CRITICAL........|_____|

The system has a built-in alarm system. Specify the level for
this data box at which the alarm should activate. Default is
9,999,990 for the particulate channels, and 100 for Temp. and
Relative Humidity. Press [<--'] to accept the default value,
or type in a new value to suit.

Prompt: LOW CRITICAL........|_____|

The alarm system also has a low level activation point used
for all channels. (For particulate channels 1 through 6 this
item should be zero).

Enter the activation level for the low level alarm. Default
is 10 for Temperature and Relative Humidity. Press [<--'] to
accept the default value.

Prompt: AUDIBLE ALARM ON CRITICAL (Y/N) |__|

If you wish, the system will sound an audible alarm when a
critical level has been reached. Default is "N". Press
[<--'] to accept the default value or [Y] to activate.

Prompt: HIGH WARNING..........|_____|

In addition to the critical level alarm system, an alarm may
also be activated when a somewhat lower WARNING level has

been reached. Default is 999,990 for the particulate count
channels, and 100 for Temperature and Relative Humidity.
Press [<--'] to accept the default value.
Prompt: LOW WARNING LEVEL......|_____|

Press [<--'] to accept the default value, or enter another
value to suit. (For channels 1 through 6 this item should be
zero).

Prompt: AUDIBLE ALARM ON WARNING (Y/N) |__|

Default is "N". Press [<--'] to accept the default value or
[Y] to activate.

As you are entering the specifications for a data box, if you
see a field that has been incorrectly entered, press [Esc] as
many times as is necessary to move up to the line in error.
Then enter the correct data and press [<--'] as many times as
is necessary to return to the desired line.

As you finish the specifications for each data box, the
system will cycle on to the next one and you must repeat the
above steps until all of the data boxes have been properly
specified. (Note that you can move backwards and forwards
from box to box by using [F7] and [F8]. This is provided for
review and revision purposes only -- it is up to you to make
sure that the specifications for each box are exactly as you
want them). After the last entry for the last data box, you
should note some disk drive activity as the information is
saved for later use.

REVISE EXISTING MAP

Prompt: PLEASE ENTER ONE OF THE LISTED ZONES

You may select any of the existing maps for revision. You
will be able to add or delete data boxes, lines and text in
exactly the same way as drawing a map from scratch. When
finished, toggle to the DRAW mode and then press [F9] to SAVE
the screen.

2-DISPLAY

Prompt: PLEASE ENTER ONE OF THE LISTED ZONES

You may select any of the maps for display on the screen. If
you select a non-existent map the system will BEEP to inform
you of the incorrect entry and then wait for another choice.

After the map is displayed the status line will show:

   F4-PRINT SCREEN   ZONE-VIEW ANOTHER MAP   Esc-ZONE INDEX

PRINT SCREEN

The status line will clear and then display:

ENCODING SCREEN FOR DUMP TO PRINTER -- PLEASE DO NOT DISTURB

Make sure that the printer is "On line" and the paper is set
to "Top of Form". After a few seconds the screen will be
dumped to the printer using an approximation of the IBM-PC
Graphics characters. The system will not do a form feed when
finished. The map will occupy somewhat less than the upper
half of the page. If you want, you can get back to the Menu
and select 5-ZONE SPECS to print the specifications for the
map on the bottom half of the page. If you do this you will
have a simple, easy to read record for reference purposes.

VIEW ANOTHER MAP

If you enter the character for an existing map, that map will
be displayed immediately. You can use this feature to
quickly display several maps as an aid in finding a certain
one for another function. If you select a non-existent map,
the system will simply return to the ZONE INDEX and ask you
to enter ONE OF THE LISTED ZONES.

3-REPLICATE

This function is provided to let you REPLICATE or duplicate a
map to another zone to save drawing time. For instance, you
might have several identical areas to monitor, serving each
with a different sensor, port combination. You can draw a
map for the first area and input the specifications. When
you REPLICATE this map to a new Zone, the specifications will
be replicated as well. It is a simple matter to revise only
those items that are different for the new map.

Prompt: **PLEASE SELECT A MAP TO REPLICATE**

Select an existing map and it will be displayed with a prompt
on the status line asking:

        IS THIS THE MAP THAT YOU WANT TO REPLICATE? (Y/N)

Any answer other than "Y" will cause the system to return to
the ZONE INDEX.

Prompt: **REPLICATE ZONE [] TO ZONE ......**

Enter the character for an empty Zone and the map will be
replicated.

If the selected Zone already has a map,

Prompt: A MAP ALREADY EXISTS FOR Zone []
                           DO YOU WANT TO REPLACE THIS ?

Any answer other than "Y" will cause the system to return to
the ZONE INDEX.

Prompt: ARE YOU SURE? (Y/N)

Again, any answer other than "Y" will cause a return to the
ZONE INDEX. This is another example of double checking to
help prevent you from making a critical move accidently.
After a map is replicated to a new ZONE, the map that was
there before will be gone forever.

After the replication is done, the SPECIFICATIONS will be
presented for revision using the same routine as used for
REVISE A MAP. First you will have an opportunity to enter a
new label for the replicated map. Then the specifications
for each box on the map will be displayed for acceptance or
revision. You may use the [F7] and [F8] keys to skip forward
or backward from box to box. As displayed on the status
line, press [F10] when the specifications need no further
revision. The replicated map with any revised labels and
specifications will be automatically saved to disk.

4-DELETE

Select this function from the opening screen if you want to
delete one or more maps from the system.

Prompt: PLEASE ENTER ONE OF THE LISTED ZONES

Select a map for deletion and it will be displayed.

Prompt: IS THIS THE MAP THAT YOU WANT TO DELETE? (Y/N)

Any answer other than "Y" will return you to the ZONE INDEX.

Prompt: ARE YOU SURE? (Y/N)

Any answer other than "Y" will return you to the ZONE INDEX.

Prompt: ZONE MAP [] IS BEING DELETED

After a bit of disk activity to delete the information
relative to the selected map you will be returned to the
opening screen.

5-ZONE SPECS

Selection of this option will bring up a new status line:

1-DISPLAY/PRINT ZONE SPECS   2-REVISE ZONE SPECS

Selection of option 1 will give you 2 choices:

1-PRINT/DISPLAY SPECS FOR A SINGLE ZONE
2-PRINT SPECS FOR ALL ZONES

PRINT/DISPLAY SPECS FOR A SINGLE ZONE

After selecting a ZONE from the Zone Index, the specs will be
displayed on the screen as shown in Fig. 4.4:

SPECIFICATIONS FOR ZONE A: SAMPLE 7300 MAP   RUN DATE: 01-19-1988

BOX	<---LABEL--->	SEN	CHN	PRT	HI-ALRM	LO-ALRM	SIG	HI-WARN	LO-WARN	SIG
1	>0.3u	1	1	1	300000	0	N	275000	0	N
2	>0.5u	1	2	1	30000	0	N	27500	0	N
3	>0.7u	1	3	1	12500	0	N	10000	0	N
4	>1.0u	1	4	1	4000	0	N	3000	0	N
5	>5.0u	1	5	1	500	0	N	400	0	N
6	>10.0u	1	6	1	10	0	N	7	0	N
7	TEMP*F	1	7	1	100	10	N	100	10	N
8	%RH	1	8	1	75	10	N	69	10	N
9	AIR VELOCITY	1	9	1	90	10	N	80	10	N
10	AUXILLIARY	1	10	1	100	10	N	90	10	N

F8 -VIEW ANOTHER   F4 -PRINT THIS SCREEN   Esc -EXIT   CAP   NUM

Fig. 4.4

Press [Esc] to return to the MENU, [F8] if you want to
display the specs for another Zone, or [F4] if you want to
send the displayed specifications to the printer. You should
consider the procedure of first displaying and printing a
Zone Map, and then using this option to print the Zone Specs
on the same page. Fig. 4.2 illustrates a sample page done
this way.

PRINT SPECS FOR ALL ZONES

If you select this option, the system will start with the
first map available by displaying the specs for that Zone and
then automatically dumping the screen to the printer with a
form feed when through so that the specs for each Zone will
be on a separate page. This will continue until the specs
have been printed for all Zones. If you find that you have
selected this option by accident and want to abort, you can
do so by just turning off the printer. An error message will
appear on the screen, but you may ignore it -- press a key to
return to the Menu.

Esc -EXIT

This option is displayed at the bottom right of the opening
screen. Pressing [Esc] will cause the system to EXIT from the
MAP module and return to the MAIN MENU.

FEDERAL STANDARD 209D MAPS

Federal Standard 209D relates to the collection and analysis
of particle concentration data to permit verification of the
airborne particulate cleanliness class of **CLEANROOMS** and
CLEAN ZONES. When working on a map that has been specified
for this purpose, you must specify a number of different
sampling locations. Since the statistical analysis of the
data uses counts for only a single particle size, all
sampling locations will be automatically set up for the size
selected by you at the start of the process. The following
screen helps you make that selection:

```
┌─────────────────────────────────────────────────────────────────┐
│              ┌─────────────────────────────┐                     │
│              │      SIZE SELECTION          │                     │
│              └─────────────────────────────┘                     │
│                                                                   │
│ THE STANDARD PERMITS SAMPLING AT ANY OF THE FOLLOWING SIZES       │
│                                                                   │
│           CLASS 1 AND 10.......:  SIZES 1 THROUGH 4               │
│           CLASS 100...........:  SIZES 2 THROUGH 4               │
│           CLASS 1000 & HIGHER..:  SIZES 4 AND 5                   │
│                                                                   │
│                     (1) - 0.1u                                    │
│                     (2) - 0.2u                                    │
│                     (3) - 0.3u                                    │
│                     (4) - 0.5u                                    │
│                     (5) - 5.0u                                    │
│                                                                   │
│              WHICH SIZE DO YOU WANT TO USE?                       │
└─────────────────────────────────────────────────────────────────┘
```

The software has built-in checking procedures that assure
that you specify a particle size that can be indeed counted
by an instrument connected to the system. (During the
Configuration process you specify the instrument(s) that are
installed).

If you specify an invalid particle size you will be advised:

            THE SYSTEM IS NOT CONFIGURED FOR THIS SIZE
            PRESS A KEY TO CONTINUE

The software will loop back and give you another opportunity
to enter a valid particle size specification. Once this is
out of the way, you move on to entering the specifications
for each box on the map. Return to page 4-8 for a complete
description of the process. As you enter the information for
each box, the port number and channel number will be assigned
automatically.

You may override this automatic assignment, and there may
well be times when you will want to do so. However, you must
remember that the integrity of the 209D Report depends on
gathering sample data from a series of different sampling
points, all set to count the same particle size. Data
redundancy checks and other measures will void any data set
generated under other than allowable conditions.

If two CI-310 MULTIPORT SAMPLERS are installed, you can
gather data from a total of 60 discreet sampling points.
This number of points will permit certification of rather
large clean areas. The best way to handle this number of
sample locations is to prepare 4 Zone Maps with 15 locations
each. The 209D Reports module allows the use of up to 4 maps
for the preparation of a report. With the system prepared
this way, you can automatically capture sample data from all
60 points for any desired period of time, and then produce a
single 209D Report to analyze and summarize the entire block
of data.

PRINTING REPORTS

Each time that you capture data with the CLIMAPS software,
the system looks at the date and if a data file does not
exist for that date, one is created. For the entire day up
to midnight all data that is acquired and processed goes into
this daily file. Depending on the configuration of your
system and how you set the instrument parameters the system
may have data for as many as 120 days or more. In order to
sort this all out, the REPORTS module will let you print 4
kinds of reports as shown on the REPORTS MENU:

```
                     REPORTS MENU

          1  -  HIGH/LOW AVERAGE  -  BY ZONE
          2  -  MARKED DATA BLOCK REPORT
          3  -  FEDERAL STD. 209D REPORT
          4  -  RAW DATA DUMP
          Esc   RETURN TO MAIN MENU
```

HIGH/LOW AVERAGE - BY ZONE

It is sometimes necessary to know the highest point that a
certain data value reached over an extended period of time,
as well as the exact time and date of the event. The same
holds true for the lowest point. The HIGH/LOW/AVERAGE report
is designed to just this job. The report can be for a span
of several days, weeks, or even months, if the data is on
file. Or, the report can be for a span of just an hour or so
of a single day. Fig. 5.1 is report covering a span of about
1-week. The header shows that the report is for the period
starting on 11-21-85 at 10:27 and ending 11-26-85 at 10:20.

The report is always prepared for a single ZONE that you
select from the ZONE INDEX. The dates for all available data
files will then be displayed with this prompt at the bottom
of the screen:

PLEASE ENTER THE NUMBER IN FRONT OF THE DESIRED STARTING DATE

The dates are organized in rows with a number in front of
each date. Enter the number of your choice and the following
prompt will be displayed:

PLEASE ENTER THE NUMBER IN FRONT OF THE DESIRED ENDING DATE

Again, enter the number of your choice. If you have entered
two legitimate numbers, the system will proceed to:

```
STARTING TIME ON   MM-DD-YY

ENDING TIME ON..   MM-DD-YY

DESIRED START TIME........
DESIRED ENDING TIME.......
```

This screen is provided so that you can print a report for a
part of a day. If you want to accept the times displayed,
just press [<--'], otherwise type in a time of your choice.
The time must be within the span displayed. You don't have
to type the ":", just two numbers for the hour field and two
for the minute field. Execution will begin as soon as two
legitimate times have been entered.

When ready, the report will be displayed on the screen as you
see it in Fig. 5.1 with the following status line:

PRESS [F4] TO PRINT REPORT   [Esc] RETURN TO MENU

If you press [F4], the system will first check to see if the
printer is "ON LINE". If not, the system will prompt:

                PLEASE PLACE THE PRINTER ON LINE
                AND SET THE PAPER TO TOP OF FORM

                PRESS [<--'] WHEN READY

When the report has been printed the system will return to
the MENU.

MARKED DATA BLOCK REPORT

One of the functions available during data acquisition is to
MARK a data block. The MARK can be compared to the slip of
paper you might place in a book to mark a page so that you
can go back later and find it. You can only print this
report if there are indeed some MARKED data blocks on file.

When you select MARKED DATA BLOCK REPORT from the MENU the
dates of all available files will be displayed on the screen
as they were for the HIGH/LOW/AVERAGE report, but this time
the date for any file with a MARKED data block will be
HIGHLIGHTED.

                              5-2

If there are no MARKED data blocks on file, the screen will
clear and display:

NO MARKED BLOCKS FOUND

PRESS [<--'] TO RETURN TO MENU

If there are MARKED data blocks, enter the number in front of
the highlighted date that you want to use.   If a legitimate
number is entered the screen will display all of the MARKED
blocks available, identified by a number and the marker text
that was entered when the block was originally MARKED.   The
number in front of the marker text locates the start of this
block in the data file.   Enter the number in front of the
desired block and preparation of the report will begin. The
system will start at the point in the data file corresponding
to the number entered and will look at every item in the file
until it finds another marker.   If no other markers are
found, the report will include all of the remaining data
items in the file.

During the report preparation you may notice a number near
the bottom of the screen rapidly changing in value.   This is
a "score-keeper" to let you know that something is going on.
As each record in the data file is read in to the computer
for processing, the number of that record is displayed in the
"score-keeping" area.

As soon as the report is ready it will be displayed on the
screen in the same format as Fig. 5.2. with the following
status line:

PRESS [F4] TO PRINT REPORT   [Esc] RETURN TO MENU

Press [F4] if you want a printed copy, or [Esc] if you were
just looking and want to return to the MENU.

FEDERAL STD. 209D REPORT

The data in the daily data files is read into the memory and
is subjected to a statistical analysis per the procedures
outlined in the Federal Specification and presented in a
summary report form shown in Fig. 5.3. Although the
preparation of this kind of report would take many man-hours
using manual data reduction methods, the computer and CLIMAPS
join together to do the job effortlessly in a few minutes.

Fig. 5.4 is the first of several pages from a typical 209D
Raw Data Printout which is only printed upon request from the
user.   This portion of the report can run 10 or more pages
long, depending on the number of sample locations and the
number of samples captured at each location.

RAW DATA DUMP

Fig. 5.5 is a typical RAW DATA DUMP. The report contains the
first 37 records in the data file used to print the MARKED
DATA REPORT of Fig. 5.2. Notice that the first line is the
marker that identified the start of the MARKED block for the
previous report. The report of Fig. 5.5 lists the data from
the data file in exactly the same format as used for storage.
Thus, the name RAW DATA DUMP.   Actually, the name is a bit
redundant since the term "DUMP" infers "a printed listing of
the data in storage".

Since the amount of data in a single daily file can approach
about 1800 records or about 36 printed pages, The RAW DATA
DUMP is limited to a single date. The date is selected in
exactly the same manner as for the other reports, and you can
enter a starting time and ending time if you want the report
to cover just a part of the day. To print a report for the
entire day, press [<--'] to accept the starting and ending
time as each is displayed.   Once you have selected the date
and times, the report will be displayed on the screen in the
same format as Fig. 5.5, with 18 lines of data per screen.
The status line will display:

[Esc]-EXIT   [F4]-PRINT   [B]-BACK ONE SCREEN   [N]-NEXT SCREEN

Two functions are unique to this report:

1. You can page forward through the report by pressing [N].
2. You can page backwards through the report by pressing [B].

Since there can be such a large amount of raw data in a daily
file, and you may be interested in printing a small part of
the total, the ability to "browse" through the file this way
will let you find the part of the data that you want. Jot
down the times for the first and last items that you want in
the printed report and then press [Esc] to return to MENU.
You can then re-select the file and input the desired start
and end times.

If you bring up a file, and after looking at some of the data
you decide to print it, press [F4]. Another special feature
has been added for this report only. During printing the
status line will display:

DUMPING DATA TO PRINTER - - (TURN OFF PRINTER TO ABORT)

With this feature, you can "bail out" if you discover that
the file is much larger than you expected, or for some other
reason you just want to stop. If you do this, an error
message will be displayed, but you can ignore it and just
press a key to return to the MENU.

REPORT FOR ZONE Q -   2-SENSOR 1-PORT
FROM 11-21-85 @ 1Ø:27 TO 11-26-85 @ 1Ø:2Ø
REPORT DATE: Ø1-1Ø-1986   21:18:38

BOX LABEL		HIGH - TIME - DATE	LOW - TIME - DATE	AVERAGE
CHAN #1	.3u	185644 - 1Ø:Ø8 - 11-26	1ØØØ58 - Ø9:55 - 11-22	128826
CHAN #2	,5u	19463 - 1Ø:Ø8 - 11-26	13176 - Ø9:17 - 11-25	15631
CHAN #3	.7u	3555 - 1Ø:28 - 11-21	757 - Ø9:13 - 11-25	2246
CHAN #4	1u	392 - Ø9:54 - 11-22	31 - Ø9:13 - 11-25	183
CHAN #5	5u	72 - Ø9:24 - 11-25	Ø - 1Ø:27 - 11-21	1
CHAN #6	1Øu	72 - Ø9:24 - 11-25	Ø - 1Ø:27 - 11-21	1
TEMPERATURE *F		47.2 - 1Ø:27 - 11-21	43.2 - Ø9:14 - 11-25	46.2
REL HUMIDITY %		58.4 - Ø9:16 - 11-25	55.6 - 1Ø:57 - 11-21	56.5
CHAN #1	.19u	1Ø32485 - Ø9:14 - 11-25	711203 - Ø9:56 - 11-22	823232
CHAN #2	.3u	289919 - Ø9:15 - 11-25	166Ø44 - Ø9:44 - 11-22	2Ø9257
CHAN #3	.5u	92854 - Ø9:3Ø - 11-22	42996 - Ø9:45 - 11-25	67988
CHAN #4	1u	287Ø3 - Ø9:3Ø - 11-22	2932 - Ø9:14 - 11-25	14894
CHAN #5	3u	48Ø3 - Ø9:3Ø - 11-22	499 - Ø9:14 - 11-25	1959
CHAN #6	5u	244 - Ø9:3Ø - 11-22	8 - Ø9:43 - 11-25	74
TEMPERATURE *F		67.2 - 1Ø:Ø2 - 11-22	61.2 - Ø9:13 - 11-25	64.8
REL HUMIDITY %		51.2 - Ø9:35 - 11-22	48.4 - 1Ø:34 - 11-21	49.6

Fig. 5.1

REPORT FOR BLOCK MARKED: ****** THIS IS A TEST MARK ONLY ****
REPORT DATE: Ø1-1Ø-1986   DATA DATE: 12-Ø2-85   21:2Ø:19

SENSOR No. 1 DATA:

CHANNEL	HIGH	TIME	LOW	TIME	AVERAGE
Ø.3Øu	124589	2Ø:33	382Ø2	23:27	87482
Ø.5Øu	6599	2Ø:35	15ØØ	23:27	4131
Ø.7Øu	535	2Ø:59	1Ø6	22:27	295
1.ØØu	81	2Ø:18	2	23:5Ø	18
5.ØØu	67	23:58	Ø	19:14	1
1Ø.Øu	67	23:58	Ø	19:14	1
T *F	5Ø.4	21:55	44.8	19:Ø1	49.3
RH %	59.2	19:Ø1	55.2	23:23	56.1

Fig. 5.2

```
           YOUR COMPANY NAME PLACED HERE
           *****   PLANT LOCATION  *****

              FEDERAL STANDARD 209D ANALYSIS
          FROM 12-03-91 @ 09:00 TO 12-03-91 @ 12:08
     REPORT DATE: WEDNESDAY DECEMBER 04, 1991


                   SUMMARY OF RESULTS

COMMON MEASURED PARTICLE SIZE ......................... 0.3um
NUMBER OF LOCATION (L) ................................ 7
MEAN OF AVERAGES (M) .................................. 245.66
STANDARD DEVIATION OF AVERAGES (SD) ................... 6.05
STANDARD ERROR OF MEAN OF AVERAGES (SE) .............. 2.29
UCL FACTOR (UCLF) .................................... 1.90
UPPER 95% CONFIDENCE LIMIT (M+(UCLF*SE)) ............. 250.00
```

ZONE	LABEL	TOTAL	SAMPLES	AVERAGE
C	LOCATION NO 1	1193	5	238.60
C	LOCATION NO 2	1251	5	250.20
C	LOCATION NO 3	1221	5	244.20
C	LOCATION NO 4	1192	5	238.40
C	LOCATION NO 5	1258	5	251.40
C	LOCATION NO 6	1266	5	253.20
C	LOCATION NO 7	1218	5	243.60

Fig. 5.3

FEDERAL STANDARD 209D ANALYSIS
FROM 06-03-88 @ 09:00 TO 06-03-88 @ 12:08
REPORT DATE: WEDNESDAY SEPTEMBER 07, 1988

ZONE	LABEL	RAW DATA	# SAMPLES	AVERAGE
C	FED. STD. 209D MAP			
	LOCATION 1	174		
		233		
		233		
		266		
		287		
	Total............	1,193	5	238.60
	LOCATION 2	197		
		234		
		252		
		281		
		287		
	Total............	1,251	5	250.20
	LOCATION 3	191		
		225		
		218		
		302		
		285		
	Total............	1,221	5	244.20
	LOCATION 4	217		
		227		
		212		
		271		
		265		
	Total............	1,192	5	238.40
	LOCATION 5	217		
		212		
		229		
		300		
		300		
	Total............	1,258	5	251.60
	LOCATION 6	244		
		207		
		235		
		289		
		291		
	Total............	1,266	5	253.20
	LOCATION 7	194		
		180		
		247		
		270		
		327		
	Total............	1,218	5	243.60

Fig. 5.4

===

SENSOR	PORT	CHAN #1	CHAN #2	CHAN #3	CHAN #4	CHAN #5	CHAN #6	T #F	RH%	TIME

**** THIS IS A TEST MARK ONLY **   10:24:56 |

	1	01	67345	2963	329	34	2	2	44.8	59.2	19:01:47
	1	02	74333	2817	251	24	0	0	44.8	59.2	19:02:48
	1	03	85745	3316	313	27	0	0	45.2	59.2	19:03:50
	1	04	63473	2703	216	21	0	0	45.2	59.2	19:04:52
	1	05	62899	2792	249	26	1	1	45.6	59.2	19:05:54
	1	06	58729	2717	211	23	0	0	45.6	58.8	19:06:56
	1	07	55961	2523	198	22	0	0	45.6	58.4	19:07:58
	1	08	57828	2708	218	14	0	0	46.0	58.8	19:09:00
	1	09	53989	2386	190	23	0	0	46.0	58.4	19:10:02
	1	10	59297	2789	224	20	0	0	46.0	58.4	19:11:04
	1	11	56419	2523	196	19	0	0	46.4	58.4	19:12:06
	1	12	58179	2679	212	15	0	0	46.4	58.0	19:13:08
	1	01	61709	2917	219	18	0	0	46.4	58.0	19:14:10
	1	02	58692	2641	195	19	0	0	46.4	57.6	19:15:12
	1	03	66429	3206	252	19	0	0	46.8	57.6	19:16:14
	1	04	63922	2924	239	17	0	0	46.8	57.6	19:17:16
	1	05	66730	3208	248	14	0	0	46.8	58.0	19:18:18
	1	06	64222	2913	220	25	0	0	47.2	57.6	19:19:20
	1	07	67209	3205	249	17	0	0	47.2	57.6	19:20:22
	1	08	67270	3133	243	23	0	0	47.2	57.2	19:21:24
	1	09	71468	3403	286	28	0	0	47.2	57.2	19:22:26
	1	10	68341	3206	268	23	0	0	47.6	56.8	19:23:28
	1	11	71138	3340	268	23	0	0	47.6	57.2	19:24:30
	1	12	69796	3182	254	15	0	0	47.6	56.8	19:25:32
	1	01	78546	3740	272	19	0	0	47.6	57.2	19:26:34
	1	02	74010	3405	274	28	0	0	47.6	57.2	19:27:36
	1	03	77641	3577	268	12	0	0	47.6	56.8	19:28:38
	1	04	73591	3318	234	15	0	0	47.6	56.8	19:29:40
	1	05	79175	3743	276	19	0	0	48.0	56.8	19:30:42
	1	06	74215	3280	243	17	0	0	48.0	56.8	19:31:44
	1	07	81441	3712	284	21	0	0	48.0	56.4	19:32:46
	1	08	81294	3740	295	15	0	0	48.0	56.8	19:33:48
	1	09	82110	3768	273	23	0	0	48.4	56.8	19:34:50
	1	10	81405	3650	225	7	0	0	48.4	56.8	19:35:52
	1	11	87144	4082	273	19	0	0	48.4	56.4	19:36:54
	1	12	83093	3682	246	16	0	0	48.4	56.4	19:37:56

Fig. 5.5

PRINTING GRAPHS

About the only way that a large amount of data can be
presented so that it can be easily understood is in some form
of graph or plot. The dot-matrix printer provides a unique
method of printing graphical information since, with proper
programming, it can print a black dot any place on a page.
If you print enough dots, and if you print them in the right
places, you can make a high-resolution graph that was next to
impossible to produce by any simple means just a few years
ago. The secret, of course lies in the programming.

The GRAPH module will automatically generate two different
types of graphs, selected from the MENU:

<div align="center">

GRAPH MENU

1 - GRAPH DAILY RESULTS

2 - GRAPH MONTHLY RESULTS

Esc   RETURN TO MAIN MENU

</div>

GRAPH DAILY RESULTS

A graph of the data in a daily file is somewhat like the RAW
DATA DUMP, in that it is a detail representation of the data
rather than a summary. All of the data on file for up to
four data boxes from any Map in the ZONE INDEX are graphed
on a single graph. This gives a very detailed picture of what
happened to the data on a minute-by-minute basis. Fig. 6.2,
the fold out Daily graph at the end of this section is a full
size reproduction of a graph printed with the dot matrix
printer.   To create this graph the system had to look at
1776 different data records and ended up calculating 222
individual points for the graph. All of this took about 4
minutes and required no special input from the operator other
than selecting the file, the ZONE, and the data box.

The system first checked the time span of the data, and
finding that it covered from about 7:00AM to about 11:30PM,
a graph with a 24 hour time scale was used running from
midnight to midnight. There are 3 other formats available,
and they are selected automatically.

The vertical or "Y" axis is also determined automatically.
The system checks the range of the data and the position of
the HIGH CRITICAL setting to determine the top of scale. The
scale is then numbered to suit. After the graph is printed
or displayed, you will have the option of re-scaling the
vertical axis. Other options allow you to either use the
default title for the vertical axis (PARTICLE COUNT), or to
input a title of your choice, and to elect whether or not to
display Critical Alarm Levels on the graph.

<div align="center">

6-1

</div>

LOGARITHMIC Y-SCALE

When making multiple line graphs it is often necessary to
include data with a very large dynamic range. For instance,
you may want to show the relationship between the particle
counts for very small and very large particles. To do this
on a single graph requires the use of logarithmic scaling for
the vertical axis so that a percentage change in a very large
number and a similar percentage change in a very small number
can be presented one above the other without distortion. The
CLIMAPS software allows selection of Logarithmic Y-scaling
each time that you create a graph, and range of scaling is
selected automatically based on the data that is being used.
A dynamic range of more than 1-million to one can be used if
needed.   Figure 6.0 shows a graph of this type.
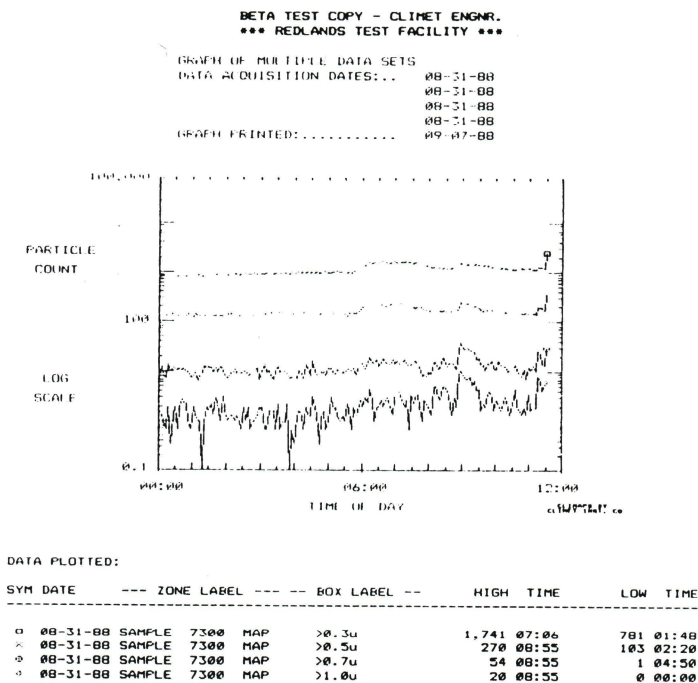
Fig. 6.0

If your system can display graphs and if you have set "SCREEN
GRAPHICS" in the CONFIG file to "Y", then the graph will be
displayed on the screen before printing. Fig. 6.1 shows how
the graph in Fig. 6.2 appeared on the screen.
If you have a monochrome system or if you have "SCREEN
GRAPHICS" set to "N" in the CONFIG file, the system will not
display a graph on the screen for approval.   Instead, the
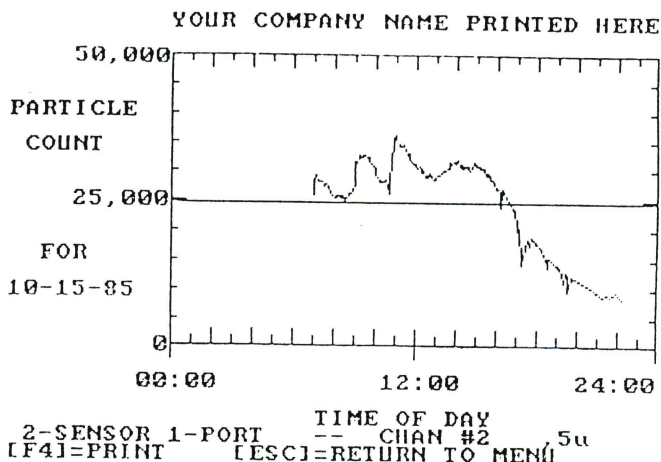graph will be printed as soon as it is ready.

Fig 6.1

If a graph is displayed on the screen you have the option of
pressing [F4] to PRINT the graph, [F5] to RE-SCALE, or [Esc]
to return to the MENU.   If you press [F4] the system will
first check to see that the printer is "ON LINE".   This means
that the printer must be turned on, loaded with paper, the
"ON LINE" light must be on, and the printer must be connected
to the computer.   If you have a printer selector switch it
should be in the correct position.   If the system detects a
problem you will see this message:

                PLEASE PLACE THE PRINTER ON LINE
                AND SET THE PAPER TO TOP OF FORM

                PRESS [<--'] WHEN READY

Check the printer and make any adjustments that are needed,
and then press [<--'].   The system will refuse to continue
until the printer is properly "ON LINE".

TOP OF FORM

This is a term that means "Set the paper so that the
perforation line is just even with of the tear-off bar on the
printer. In some word processing the same term means to set
the paper to a different point, but the CLIMAPS system is
designed to make things simple, so we have elected to set the
paper so it will be ready to tear off at the end of a form
feed. (This is only precisely correct if you are using the
specified Epson FX-85 printer or another equivalent one with
the tear-off bar in the same position relative to the print
head).

RE-SCALE A GRAPH

There will be times when you won't be satisfied with the
scale selected by the system. The RE-SCALE function is
called up by pressing [F5]. The following screen will then
be displayed:

```
┌─────────────────────────────────────┐
│         Re-Scaling Options           │
├─────────────────────────────────────┤
│                                      │
│          Increase Y-scale            │
│                                      │
│          Decrease Y-scale            │
│                                      │
│          Use Maximum data            │
│                                      │
│          Specify new range           │
│                                      │
│          Return to Menu              │
│                                      │
├─────────────────────────────────────┤
│                                      │
│        Press <--' to execute         │
└─────────────────────────────────────┘
```

Fig. 6.2b
RE-SCALE Options

You can elect to increase the top of scale by a factor of
approximately 2, (or 10 for logarithmic), decrease top of
scale by the same amount, or specify a new range for the
graph. Bottom and top of scale must be a multiple of 10.

YOUR COMPANY NAME PRINTED HERE
** A TYPICAL CLIMAPS REPORT **

```
GRAPH OF DATA FOR ZONE Q -    2-SENSOR 1-PORT
BOX LABEL.................    CHAN #2    ,5u
DATA ACQUISITION DATE:...    10-15-85
GRAPH PRINTED:...........    01-12-86
```
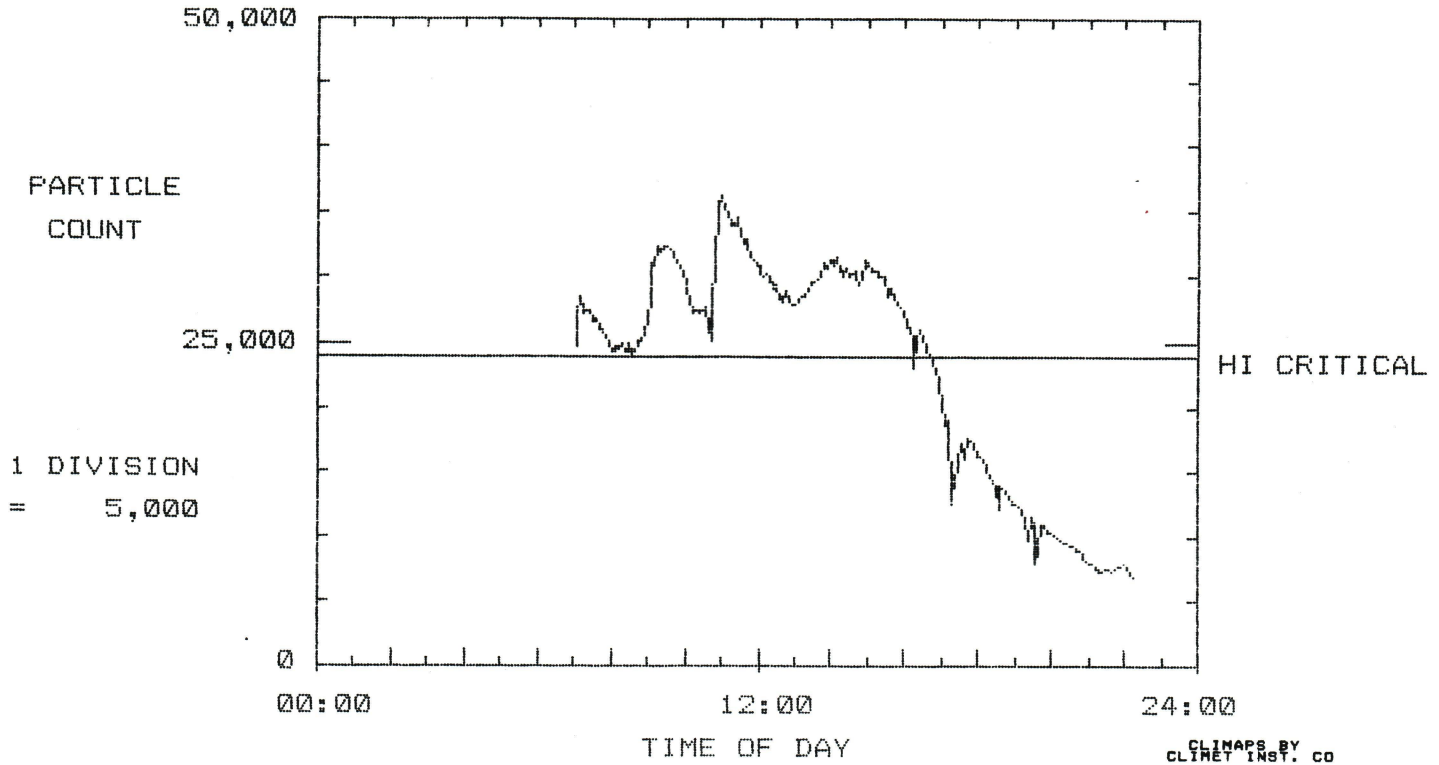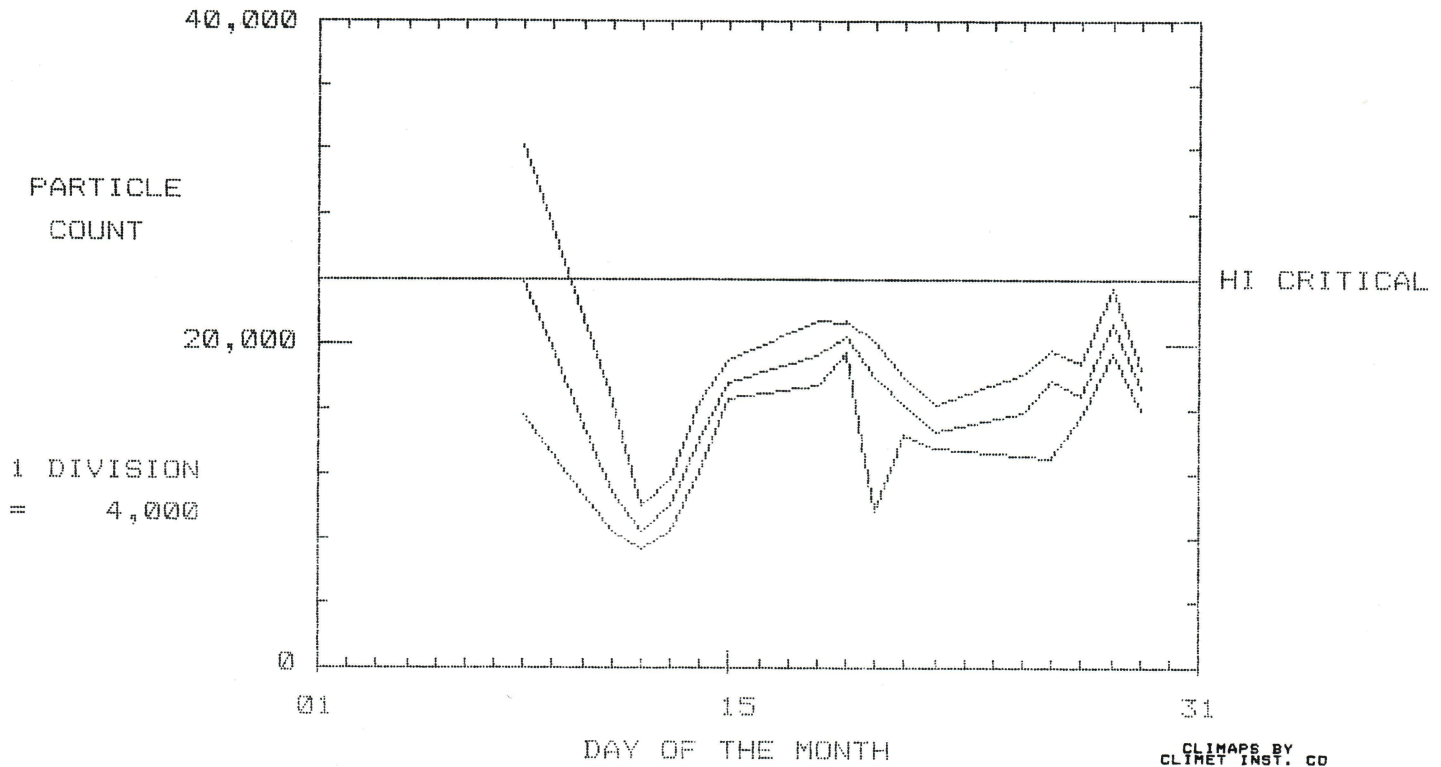


```
HIGH CRITICAL SETTING...    24000
HIGHEST POINT...........    37496
OCCURRED AT.............     10:59
HIGH WARNING SETTING....    20000
LOWEST POINT............     6038
OCCURRED AT.............     19:24
```

Fig. 6.2

YOUR COMPANY NAME PRINTED HERE
** A TYPICAL CLIMAPS REPORT **

```
GRAPH OF DATA FOR ZONE Q -     2-SENSOR 1-PORT
BOX LABEL.................     CHAN #2    ,5u
STARTING DATE:...........     11-08-85
ENDING DATE:.............     11-29-85
GRAPH PRINTED:...........     01-12-86
```


HIGH CRITICAL SETTING...   24000
HIGHEST POINT...........   32285
OCCURRED ON.............   11-08-85 AT 09:23
HIGH WARNING SETTING....   20000
LOWEST POINT............   7297
OCCURRED ON.............   11-12-85 AT 10:32

UPPER PLOTTED LINE REPRESENTS DAILY HIGHS
LOWER PLOTTED LINE REPRESENTS DAILY LOWS
MIDDLE PLOTTED LINE REPRESENTS DAILY AVERAGES

Fig. 6.3

GRAPH OF DAILY AVERAGES
FOR THE MONTH OF NOV, 1987
STARTING DATE:............   11-02-87
ENDING DATE:.............   11-27-87
GRAPH PRINTED:...........   09-07-88
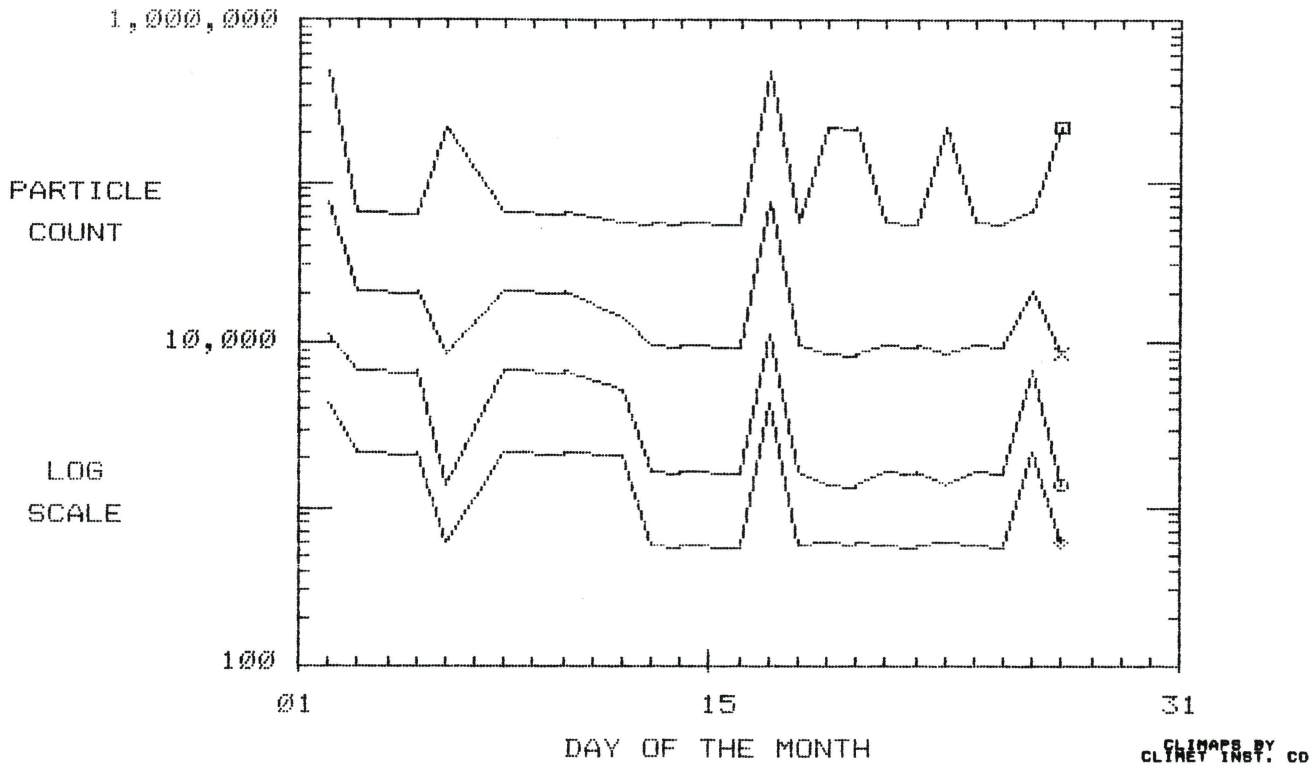
SYM	--- ZONE LABEL ---	-- BOX LABEL --
▣	SAMPLE 7300 MAP	>0.3u
⋈	SAMPLE 7300 MAP	>0.5u
⊙	SAMPLE 7300 MAP	>0.7u
◇	SAMPLE 7300 MAP	>1.0u

Fig 6.4

GRAPH MONTHLY RESULTS

When you select "GRAPH MONTHLY RESULTS", the system will
calculate the daily HIGH point, the daily LOW point and the
daily AVERAGE for as many or as few days in a single month as
you wish, just like it did for the HIGH/LOW/AVERAGE report if
you are graphing a single box. If you are graphing 2 or more
boxes just the average for the month is graphed. The graph
is then created using this information. The same re-scaling
options that are available for the daily graphs are also
provided for the monthly graphs. Fig. 6.3 is a full size
reproduction of a typical monthly graph of a single box.
Fig. 6.4 shows a monthly graph using 4 different data sets.

You must first select a starting date and an ending date the
same way as for the HIGH/LOW/AVERAGE report except the dates
must all fall in the same calendar month. You then select a
ZONE MAP and then a specific data box on the MAP. In case
you wonder why you can select just one data box it is because
the range or maximum size of data values from box to box
varies so widely that putting the data for two different data
boxes on the same graph is just impractical.

Computation of all of the data points for a 30 day graph can
take up to 45 minutes or more if you have large data files
for each day of the month. As a rule of thumb, computation
of data will take about 1.5 minutes for a typical large data
file such as the one used for the daily graph in Fig. 6.2.
For smaller data files the computation time will be less.
Keep this in mind when you graph monthly results and do the
job when the computer system can be devoted to this task for
the necessary amount of time.

GRAPHS ON THE PLOTTER

If you have configured your system to include the EPSON HI-80
4 color pen plotter, you can plot daily and monthly results
in four colors and in a somewhat larger format than used for
the graphs done on the dot matrix printer.   Many people feel
that the pen-plotted graphs are more suitable for technical
reports and presentations.

The PLOT module will automatically generate two different
types of graphs, selected from the MENU:

```
┌─────────────────────────────────────────┐
│                                         │
│             PLOTTER MENU                │
│                                         │
│        1 - PLOT DAILY RESULTS           │
│                                         │
│        2 - PLOT MONTHLY RESULTS         │
│                                         │
│        Esc  RETURN TO MAIN MENU         │
│                                         │
└─────────────────────────────────────────┘
```

PLOT DAILY RESULTS

Fig. 7.1, the fold out Daily graph at the end of this section
is a full size reproduction of a graph plotted using the same
data as used for the graph in Fig. 6.2.   The only difference
between the two is that Fig. 7.1 was created using the PLOT
module and plotted in four colors on the EPSON HI-80, while
Fig. 6.2 was printed on the dot matrix printer in black and
white.

Note the larger format and the crispness of the pen-drawn
lines of the plotted graph.   The plotted data is in blue and
the HI CRITICAL line is in RED.   If this were a plot of data
set with a Low Alarm set, there would also be a LOW CRITICAL
line in GREEN.   The title and most lettering is done in
BLACK.

The plotter responds to a different set of commands than the
dot matrix printer, which is the reason that the two methods
for creating graphs are in separate program modules.

In order for the colors to come out as described you must
install the 4 pens into the holder in proper order.

INSTALL PLOTTER PENS

Refer to page 1-5 of the plotter manual, or the section
titled: Installing the Pen Cartridge.

Follow the directions and remove the pen cartridge from the
plotter.   There four holes in the cartridge intended to hold
the four pens.   Note that the holes are numbered from 1 to 4.

Remove the cap from the **BLACK** pen and insert the pen into
hole number 1.   Gently push it straight in until it clicks
past the latch.

Remove the cap from the **RED** pen and insert the pen into hole
number 2.

Install the **GREEN** pen into hole number 3.

Install the **BLUE** pen into hole number 4.

Install the pen cartridge into the plotter.   Section 1.5.3 in
the plotter manual shows exactly how to do it.

Most people prefer to use a special grade of paper for
plotting.   It has a glossy, coated surface that produces
crisp lines.   If you use a paper with a rough surface the
pens tend to skip from the top of one high spot to the top of
the next one.   The resultant lines don't have the sharpness
that you get with the coated paper.   If you don't have the
special plotter grade of paper your next choice should be
copier bond, the type of paper used in electrostatic copiers.

When the carriage is all the way to the right the plotter
pens are automatically capped.   This is done to prevent
drying of the ink at the tip of the pens.   If the plotter has
been idle for several days and the pens have not been
properly capped, you will probably find that the ink in the
pen tips has dried out so that the first few lines drawn with
each pen will tend to skip until the ink flow is established.
The plot module prompts you to handle the plotter in such a
way that the pens will always be capped automatically when
each graph is finished.

Prompt: **TURN OFF THE POWER SWITCH ON THE
               RIGHT SIDE OF THE PLOTTER**

This cancels any residual commands that might be in the
plotter memory.

Prompt: INSERT A PIECE OF PLOTTER PAPER FROM THE FRONT,
                GLOSSY SIDE UP, AND ALIGN IT WITH THE GUIDE LINES
                ON THE INSIDE. THEN MOVE THE LEVER ON THE LEFT
                SIDE OF THE PLOTTER TO <u>HOLD</u>

                NOW TURN THE POWER SWITCH BACK ON

                PRESS A KEY WHEN READY

If you follow these instructions you will get the paper into
the plotter correctly. When you turn the power back on, the
pens will be uncapped and the carriage will move to the
"HOME", or starting position. The plotter will then move the
paper all of the way in and then back out of the plotter to
the correct starting point. There are other possible ways to
do this job, but if you follow these instructions you should
always get it right.

As soon as you press a key to indicate that the system is
ready, the plotter will come alive and create the graph that
you have specified. When finished the following will be
displayed:

Prompt: FIRST....
                TURN OFF THE POWER SWITCH ON THE RIGHT SIDE

                NEXT.....
                MOVE THE LEVER ON THE PLOTTER TO <u>FREE</u>
                AND REMOVE THE GRAPH

                PRESS A KEY TO CONTINUE

The last command sent to the plotter when the graph was
finished was to "PARK THE HEAD AND CAP THE PENS". Now, when
you turn off the power the pens will remain in that position
until the next time that the plotter is used, whether that be
a few minutes or several days. This is an example of the
CLIMAPS philosophy of making everything as simple as possible
without compromising performance.

When you remove the graph, handle it by the edges since the
ink will most likely still be a little wet.

In all other aspects, the PLOT module is the same as GRAPH.

If your system can display graphs and if you have set "SCREEN
GRAPHICS" in the CONFIG file TO "Y", the graph will be
displayed on the screen before dumping to the plotter. On the
other hand, if you have a monochrome system or if you have
set "SCREEN GRAPHICS" to "N" in the CONFIG file, no graph
will be displayed on the screen.   The graph will be plotted
as soon as it is ready.

If a graph is displayed on the screen you have the option of
pressing [F4] to PLOT the graph, [F5] to RE-SCALE, or [Esc]
to return to the MENU. If you press [F4] the system will
first check to see that the plotter is "ON LINE". If you
have a single parallel port and a printer selector switch,
make sure that the switch is in the "PLOTTER" position
because the system can't tell the difference between the
printer and the plotter. Instead of a nice graph, if you
send the plotter information to the printer all you will get
is a page of garbage.

PLOT MONTHLY RESULTS

MONTHLY RESULTS can be plotted in the same manner as with the
GRAPH module, except the MONTHLY plot will show a plot of
daily HIGHS in RED, daily LOWS in GREEN, and daily AVERAGES
in BLUE. Fig. 7.2, the fold out monthly graph at the end of
this section is a full size reproduction of a graph plotted
using the same data as used for the printed graph Fig. 6.3.

The same time considerations apply to plotting monthly data
as discussed in section 6. You should plan the plotting of
monthly data for a time when the computer can be dedicated to
this function for the necessary time.

Fig. 7.2

Fig. 7.1

YOUR COMPANY NAME PRINTED HERE
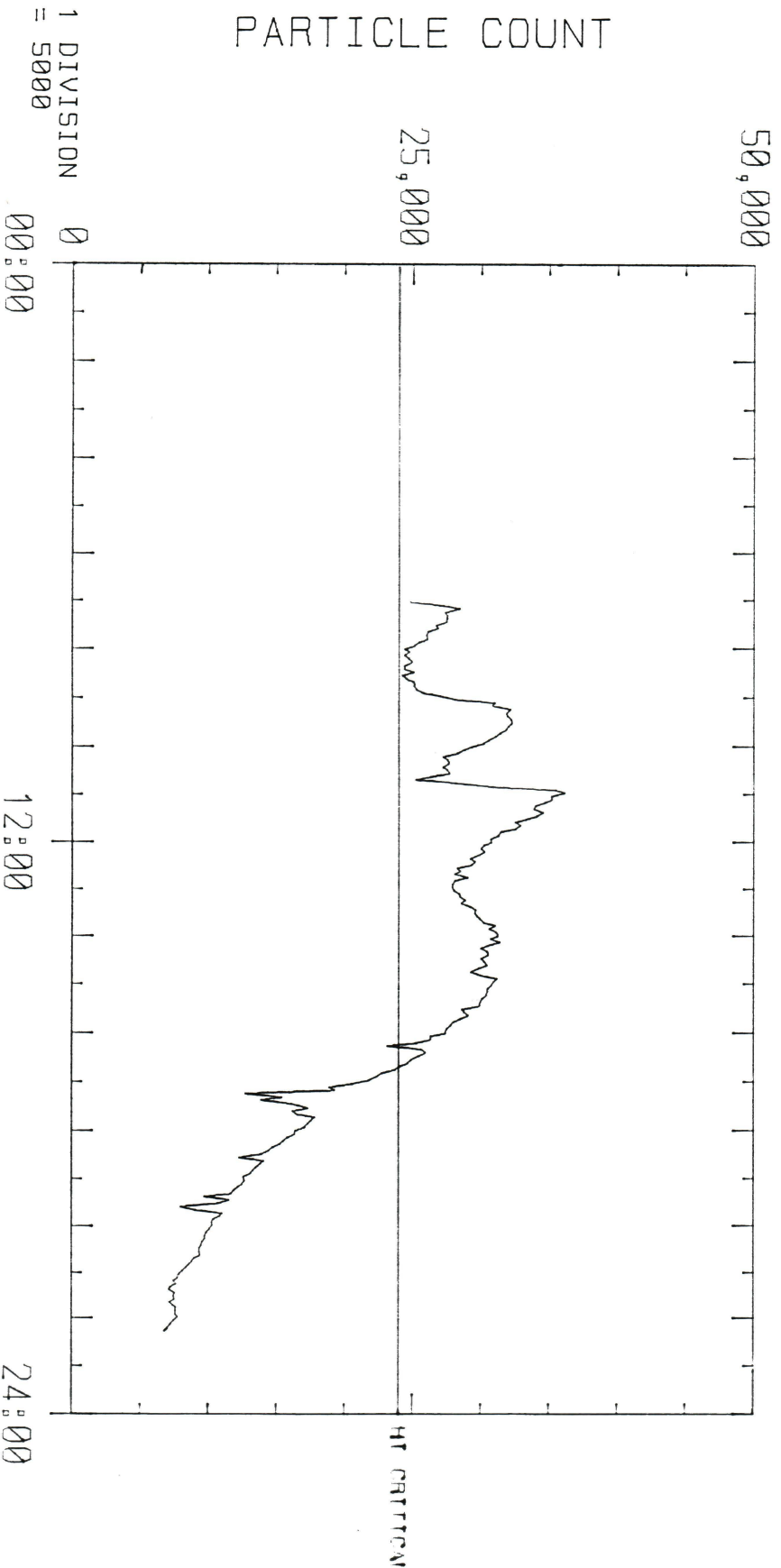
** A TYPICAL CLIMAPS REPORT **

PARTICLE COUNT

1 DIVISION
= 5000

50,000

25,000

0

00:00   12:00   24:00

TIME OF DAY

HI CRITICAL

CLIMAPS BY
CLIMET INST. CO

GRAPH OF DATA FOR ZONE Q -   2-SENSOR 1-PORT
BOX LABEL.................   CHAN #2   ,5u
DATA ACQUISITION DATE:...   10-15-85
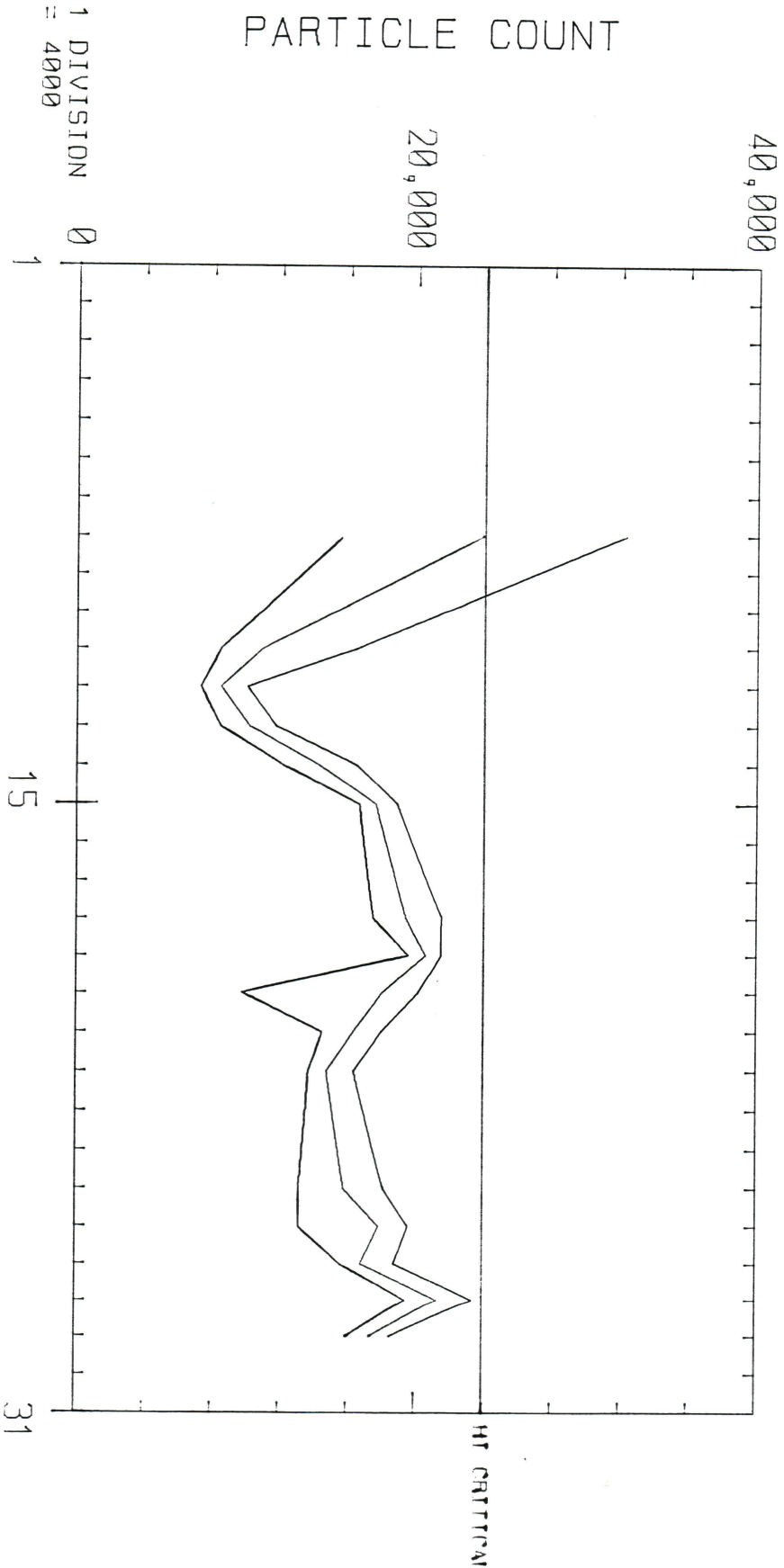GRAPH PRINTED:...........   01-12-86

HIGHEST POINT.............   37496
OCCURRED AT..............   10:59
LOWEST POINT.............   6038
OCCURRED AT..............   19:24
HIGH WARNING.............   20000

——— =HIGH CRITICAL 24000

Fig. 7.1

PARTICLE COUNT

YOUR COMPANY NAME PRINTED HERE

** A TYPICAL CLIMAPS REPORT **

1 DIVISION = 4000

40,000

20,000

0

HI CRITICAL

DAY OF THE MONTH

1   15   31

GRAPH OF DATA FOR ZONE Q - 2-SENSOR 1-PORT
BOX LABEL.............. CHAN #2 ,5u
STARTING DATE:........ 11-08-85
ENDING DATE:.......... 11-29-85
GRAPH PRINTED:........ 01-12-86

HIGHEST POINT,............... 32285
OCCURRED ON,.... 11-08-85 AT 09:23
LOWEST POINT................. 7297
OCCURRED ON.... 11-12-85 AT 10:32

————— =HIGH CRITICAL............ 24000
————— HIGH WARNING............. 20000

CLIMAPS BY
CLIMET INST. CO

————— =DAILY HIGH POINTS
————— =DAILY AVERAGE
————— =DAILY LOW POINTS

Fig. 7.2

When you select 8 - FILE UTILITIES from the Main Menu the
following menu is displayed:

```
                    FILE UTILITIES MENU

              1. PURGE OLD DATA FILES
              2. CREATE ASCII SPREADSHEET FILE
              3. UPDATE INDEX FILE

              Esc  RETURN TO MAIN MENU

              PRESS THE NUMBER OF YOUR CHOICE
```

PURGE OLD DATA FILES

If you use the system on a regular basis, you will have to
periodically purge out some of your old data files to make
room for current data. If the old information is no longer
of any value, you can simply purge it without any prior
preparation. However, if the old data must be preserved for
any reason you should make archive copies of all data files
that you plan to purge before proceeding further. (Many
users systematically backup their data files and store these
backups at a location remote from the computer as a simple
means of guarding against catastrophic loss).

On selection of the PURGE function, the screen display
changes to:

```
                    PURGE INSTRUCTIONS

     ALL OF THE DATA FILES FOR THE OLDEST MONTH ON RECORD
     WILL BE PURGED FROM THE DATA AREA ON THE HARD DISK IF
     YOU AGREE TO GO AHEAD.  IT IS NECESSARY TO DO THIS
     PERIODICALLY IN ORDER TO PROVIDE ROOM FOR NEW DATA.

     IF YOU HAVE NOT YET CREATED ARCHIVE COPIES OF THESE
     FILES, YOU SHOULD EXIT AND DO SO NOW UNLESS YOU WANT
     TO SIMPLY DISCARD THE OLD DATA.
```

           DRIVE C: CONTAINS FILES FOR THESE MONTHS:

The data files are listed by month and year. You may now
purge them one month at a time, always getting rid of the
oldest month on file. When PURGE is complete the INDEX file
is updated automatically.

CREATE ASCII SPREADSHEET FILE

From time to time you may want to analyze and process the
data collected by CLIMAPS in a way not available within the
software. For example, if a very special task is being
monitored by CLIMAPS and operation continues past midnight
into a new day, the captured data will be contained in 2
separate data files. There is no convenient way in CLIMAPS
to plot the data across midnight on a single sheet of paper
as a continuous line. However, you can select a file, or
even a portion of a file and create a new ASCII file for use
with spreadsheet programs with the same command structure as
LOTUS 123. The new file will be saved with a .PRN extension
so that it can be imported directly.

The data may be obtained from a floppy diskette or from the
hard disk so long as the INDEX file has been UPDATED so the
system can find the data file.

The new file may be saved to the location of your choice. It
is suggested that you save it to the directory where your
spreadsheet data files are located. For instance if you have
LOTUS 123 installed in the \LOTUS directory on drive C:, and
have set up a sub-directory C:\LOTUS\DATA for the LOTUS data
files, you should specify the location for the new file as:

                    C:\LOTUS\DATA\

The on-screen instructions will explain this as you proceed.

In the example discussed above, you might select a file for
day 1 and choose a starting time of 14:00 to give an 8-hour
span to the first ASCII file. For day 2 you could choose the
start of the file as a starting time and whatever time you
want for the ending time.

After saving the files to the spreadsheet data sub-directory
you should exit CLIMAPS and then run the spreadsheet program
to work on the two files.   In LOTUS, Import the first file
with the command series: / File   Import   Numbers.

A list of all files with the extension .PRN will be displayed
so that you can pick the one that you want. The file will
be imported in useable format and you can create a graph by
simply setting parameters and ranges. To merge in the file
for day 2, position the cell marker at the position where you
want the second file to start and repeat the Import command
series. Some cell editing will be necessary to combine the 2
files to produce a smooth sequence of data columns. This
procedure will allow you to quickly generate the graph
proposed above with a data line progressing across the
midnight dividing line.

8-2

UPDATE INDEX FILE

In order to manage the potentially large mass of data that
can be generated with the system, all data files are named
for the date of creation and indexed for simple retrieval.
Each time that the system creates a new data file the INDEX
file is updated automatically. As you run the software and
use functions that require access to data, the INDEX file is
used to display a numbered list of files available. If you
manually delete a data file for whatever reason, and then try
to use that file, a "FILE NOT FOUND" error will result
because the INDEX says that the file is available, but when
the system goes to look for it, it's nowhere to be found.

Select: 3. UPDATE INDEX FILE from the File Utilities Menu and
in moments a new, current INDEX file will be created listing
all of the files available on the system at that moment.

On occasion you may want to review some old data that is
stored on an archive diskette or tape. Just copy the file(s)
to your data directory and then UPDATE the INDEX FILE from
within CLIMAPS as above. You will find your file(s) properly
listed according to the date of creation and available for
use as a current file. This is the only way that you can use
files that have been removed from the hard disk and then
restored.   The INDEX method of file management is an
absolutely foolproof way to handle the potentially large
number of data files that can be created with the CLIMAPS
software.

ERROR MESSAGES

1.   YOU HAVE TRIED TO USE COMMUNICATION PORT COM2:
      BUT THE SYSTEM DOES NOT FIND THIS PORT INSTALLED.

      YOU MUST EITHER INSTALL COM2: OR ELSE CONFIGURE
      THE SYSTEM FOR A SINGLE SENSOR.

What it means: You have not set the value for the number of
sensors in the CONFIG file to match the number of serial
ports installed.

What to do: If you have only 1 serial port installed you
must set the CONFIG value to 1 sensor, and you can only use 1
sensor.

2.   CANNOT PROCESS LAST DATA RECEIVED.
      PLEASE CHECK DATA CABLE(S) AND INSTRUMENT(S)

What it means: A block of data has been acquired that cannot
be processed because of missing information.

What to do: Check the data cable for loose connections or
frayed conductors. Also check the instrumentation to make
sure that the electrical connection is sound. If all appears
to be OK, go to the system configuration module and select
the next lower BAUD rate. Then change the setting of the DIP
switch in the instrument to reflect the new BAUD rate. If
your system has two sensors, the BAUD rate must be set the
same for both.

3.   THE SYSTEM HAS DETECTED A DISK MEDIA ERROR....
      USUALLY THIS MEANS THAT THE DISK HAS GONE BAD.

What it means: The system was unable to read or write data

What to do: Return to the MAIN MENU and END THE SESSION.

If you are using your hard disk for storage then run system
diagnostics on your hard disk to determine if the problem can
be located and fixed. On occasion problems like this come up
because of an undocumented bad spot on the hard disk. If
such a spot can be located it can be added to the bad track
map so that it will no longer be used. If the problem
persists you should make a full backup of all information on
the hard disk and then have it serviced or replaced. Many
times simply re-formatting the hard disk and re-installing
the software will correct such problems.

If you are saving data to a floppy diskette, you should
discard the diskette that caused the error message and create
a new one using your most recent backup. It is for exactly
this kind of situation that we urged you earlier to backup
your data files on a regular basis

4.   OUT OF PAPER
        PRESS A KEY TO CONTINUE

What it means: The system has detected a "paper out"
condition on the printer.

What to do: Get a new supply of paper and feed it into
the printer. Set the perforation line even with the top of
the "Tear Off" bar. Press a key when the printer is back ON
LINE.

5.   PRINTER NOT ON LINE
        PRESS A KEY TO CONTINUE

What it means: Either the printer is not turned or not
connected to the computer, or the "ON LINE" light is not on.

What to do: Check to see that the printer is plugged in
the 120V power. Then check to make sure it is properly
connected to the computer. If you have 2 parallel ports, the
printer must be plugged into "LPT1:". If you have a printer
selector switch, make sure that the switch is in the
"PRINTER" position and properly connected. If the printer is
turned on but the "ON LINE" light is not on, then press the
"ON LINE" button on the top right side of the printer. Press
a key to continue.

6.   PLEASE CHECK THE SYSTEM CONFIGURATION
        IF YOU HAVE SELECTED LPT2: FOR CONNECTION
        OF THE PLOTTER, THEN CHECK TO MAKE SURE THAT
        THE SYSTEM HAS A SECOND PARALLEL PORT INSTALLED

        PRESS A KEY TO CONTINUE

What it means: The system tried to send plotter information
to parallel port LPT2: because the CONFIG file has been set
up with LPT2: as the designated plotter port. However, the
system does not find LPT2: as a valid installed port.

What to do: First, press a key to return to the PLOT MENU
and then press [Esc] to return to the MAIN MENU. Then do
either of the following:

A. Connect the plotter to LPT1: with a printer selector
switch. Then select 7 - SYSTEM CONFIGURATION and change the
CONFIG file to indicate LPT1: as the port where the plotter
is connected. Return to the MAIN MENU and then return to the
PLOT module.

B. End the session by pressing [Esc]. Install a second
parallel port, and connect the plotter to LPT2:. When done,
run CLIMAPS as usual.

7.   NO DATA FILES FOUND
      PRESS A KEY WHEN READY

What it means: The system looked for the file INDEX.NDX in
the location specified in the CONFIG file for saving data and
failed to find anything.
What to do: If you have specified one of the floppy
drives as the data drive then check to make sure that a data
diskette is correctly installed in the drive and the door is
closed.

If you have specified the hard drive as the data drive then
check to see if any data files exist in the default directory
of the drive that you have specified. For instance, if you
have installed the software on drive C: in the \CLIMAPS1
directory, that is where you should look for data files.
They are easy to recognize. The filename format is:

          MM-DD-YY.DAT, or for example, 08-21-88.DAT.

In either case, if data files are located where they are
supposed to be, run CLIMAPS and select from the MAIN MENU:

                    8 - FILE UTILITIES

From the FILE UTILITY MENU, select:

                    3. UPDATE INDEX FILE

The INDEX file will be updated to include only those data
files found in the specified location.   This action should
be taken each time you manually change the file content of
the data file location. Remember, the Update function is
provided so that you can copy data files back to the
directory or erase old files that are no longer needed from
the data directory. However, you must run the UPDATE
function each time you manually change the data files.

9.   **** THE COMMUNICATION BUFFER HAS OVERFLOWED ****
      USUALLY THIS MEANS THAT THE SYSTEM HAS BEEN FLOODED
      WITH ALARM MESSAGES FROM THE INSTRUMENTATION.
      PRESS A KEY TO CLEAR THE BUFFERS AND RETURN TO THE
      DATA ACQUISITION MENU. CHECK THE INSTRUMENT ALARM
      SETTINGS AND CORRECT ANY ERRORS. THEN RESUME DATA
      ACQUISITION.

What it means: The COMMUNICATIONS BUFFER is an area in the
computer memory that has been set aside for the sole purpose
of receiving data from the instruments. If the computer is
busy doing some other chore, data coming from the instrument
is received into the buffer and held there until the computer
can get around to processing it.

Each time an alarm setting in the instrument is violated, a
message is transmitted with details of the alarm condition.
These transmissions are not used by the computer since the
CLIMAPS software determines ALARM conditions based on the
alarm settings for each individual area MAP.

What to do: The easiest thing to do if this error message
is displayed is to turn the instrument alarm settings OFF.
This may not be a viable solution in some cases, however.

If alarms are set on the instrument(s) first check to make
sure that they are set to sensible levels. After all, an
alarm does no good at all if it goes off every time an event
takes place. If it is found that alarms are properly set,
the sampling system should be checked for leaks. A small
hole in a sample line can easily be the source of spurious
counts that set of an alarm.

If the error message continues to be a problem then you
probably have a housekeeping problem that should be addressed
and corrected.

10.   ERROR [][] IN [][][][]
       PRESS A KEY TO CONTINUE
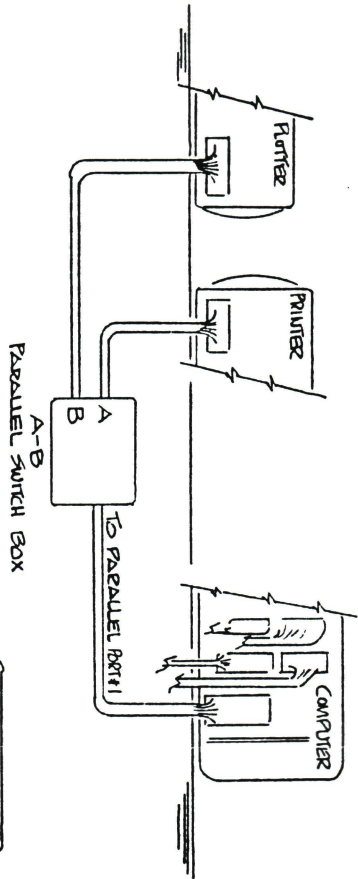
What it means: An undocumented error has occurred.

What to do: Copy the information on the screen. Then press
a key to return to the Menu. Select an option and try again.
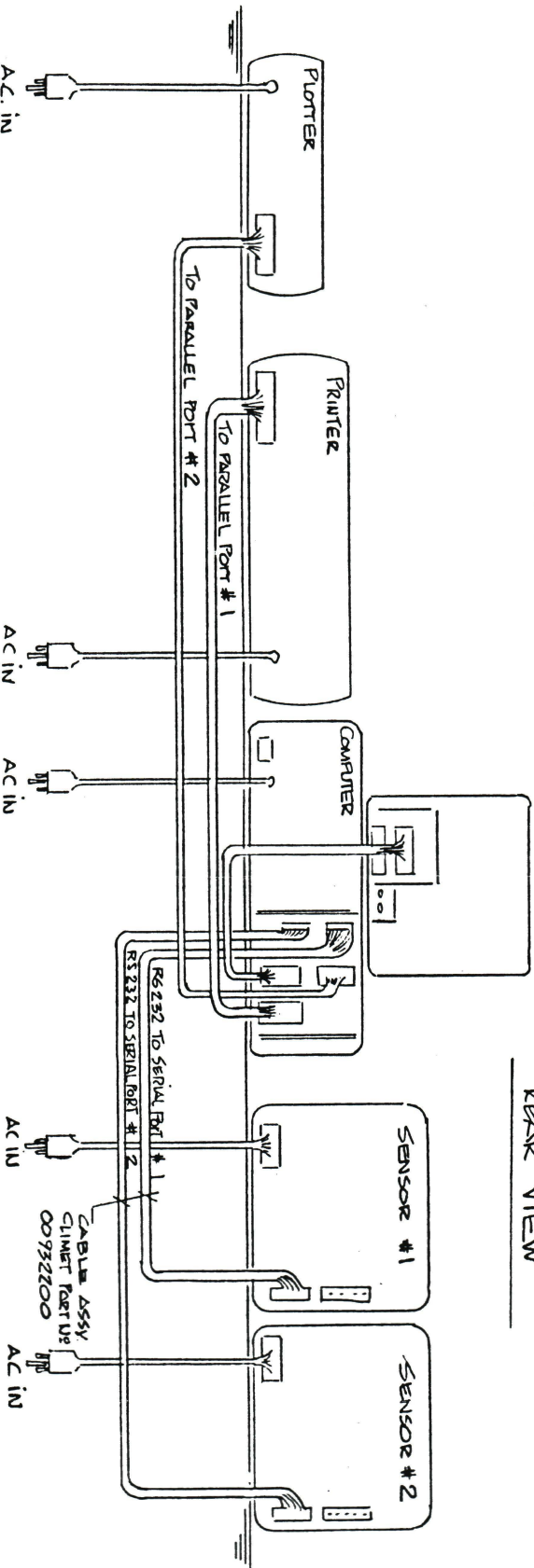If the problem persists, get technical assistance.
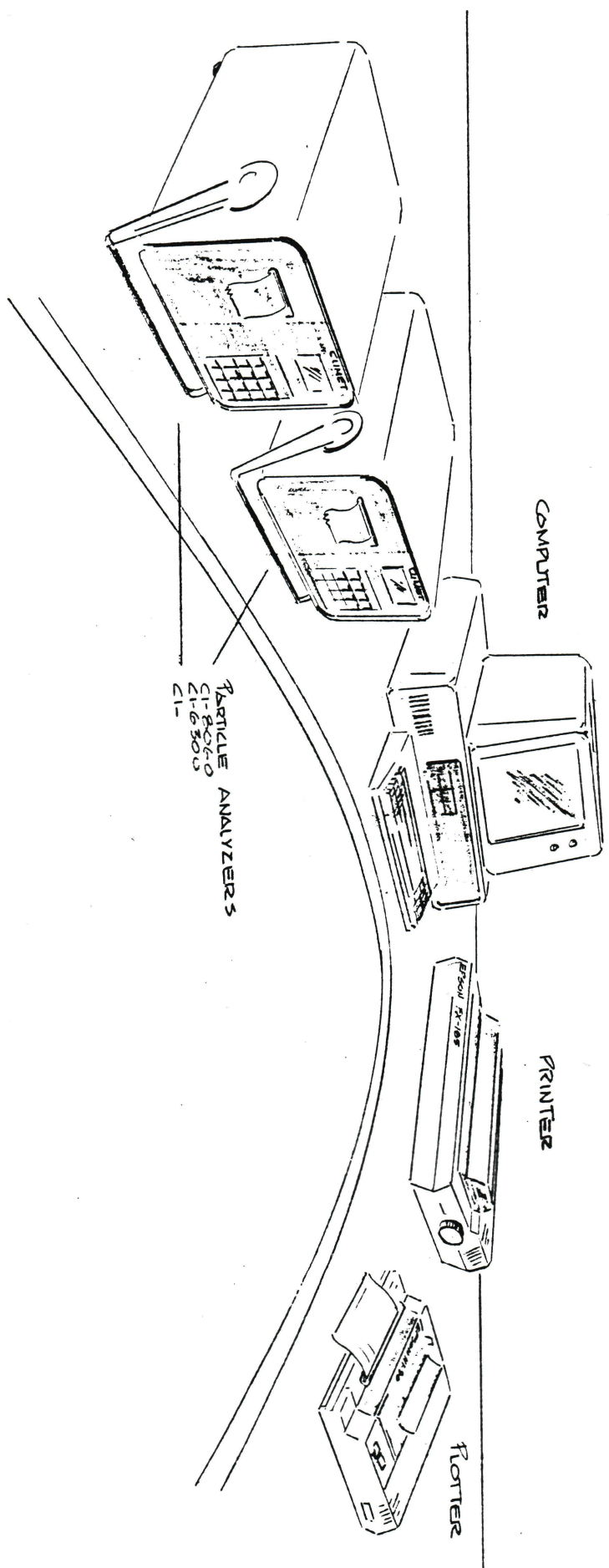
ARRANGEMENT OF THE INSTRUMENTS

COMPUTER

PRINTER

PLOTTER

PARTICLE ANALYZERS
CI-806-0
CI-630-0
CI-

TYPICAL HOOK-UP ARRANGEMENT

OPTIONAL PRINTER/PLOTTER HOOK-UP
USING THE PARALLEL PORT #1 AND
A-B SWITCH BOX.

A-B
PARALLEL SWITCH BOX

REAR VIEW

PLOTTER

PRINTER

COMPUTER

SENSOR #1

SENSOR #2

To PARALLEL PORT #2

To PARALLEL PORT #1

RS 232 To SERIAL PORT #1

RS 232 To SERIAL PORT #2

To PARALLEL PORT #1

CABLE ASSY
CLIMET PART No
00932200

A.C. in

AC in

AC in

AC in

AC in

DB25 TO DB25

TO COMPUTER

FEMALE

MALE

WHT

BLK

RED

SHIELD
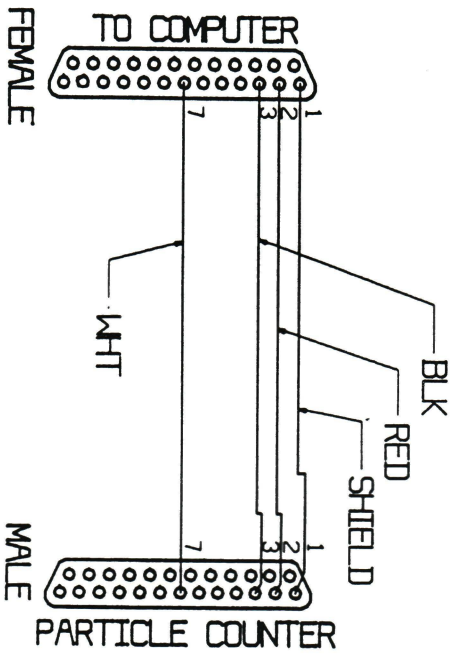
CABLE ASSY 00933600 SUPPLIED BY CLIMET

PARTICLE COUNTER

DB9 TO DB25

FEMALE

BLK

RED

WHT

MALE

ALT. WIRING DIAG.